James Miller.

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THE

EDINBURGH

MEDICAL AND PHYSICAL DICTIONARY.

VOL. I.

Ex Libris

Jacobi THE Miller

EDINBURGH
MEDICAL AND PHYSICAL DICTIONARY,

CONTAINING

AN EXPLANATION OF THE TERMS OF ART

IN

ANATOMY,
PHYSIOLOGY,
PATHOLOGY,
THERAPEUTICS,
SURGERY,
MIDWIFERY,
PHARMACY,
MATERIA MEDICA,
BOTANY,
CHEMISTRY,
NATURAL HISTORY,
&c. &c.

AS EMPLOYED IN THE PRESENT IMPROVED STATE OF MEDICAL SCIENCE;

AND ALSO,

A COPIOUS ACCOUNT OF DISEASES AND THEIR TREATMENT,

AGREEABLY TO THE DOCTRINES OF

CULLEN, MONRO, HUNTER, FORDYCE, GREGORY, DENHAM, SAUNDERS, HOME,

AND OTHER MODERN TEACHERS IN EDINBURGH AND LONDON.

TO WHICH IS ADDED,

A COPIOUS GLOSSARY OF OBSOLETE TERMS,

CALCULATED TO ASSIST THOSE WHO HAVE OCCASION TO REFER TO THE WRITINGS OF THE ANCIENTS.

IN TWO VOLUMES, WITH MANY PLATES.

By ROBERT MORRIS, M.D.
JAMES KENDRICK, Surgeon, F.L.S.
AND OTHERS.

Volume I.

EDINBURGH:
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ADVERTISEMENT.

IT is a sufficient apology for the publication of a work of this kind, to observe, that no Medical Dictionary, on an equal scale, has been compiled from original sources, since that of Dr. Motherby; which, to much that was borrowed from *his* almost obsolete predecessors, avowedly derived all that could be deemed valuable *at the time of publication*, from writings, which *to us*, can scarcely be reckoned of the smallest utility. It is notorious that, within the last thirty or forty years, many branches of medical science have been improving most rapidly. Systems wholly new, new modifications of older theories, new nomenclatures, new discoveries, and even new diseases, have been brought to light; yet the student and practitioner have been left to trace these subjects through innumerable volumes, for want of that indispensable article in a Medical Library, A DICTIONARY, in which they might be found, in a narrow compass, treated copiously, or otherwise, according to their importance, and capable of being resorted to, by the busiest practitioner, on the spur of the occasion.

With regard to the execution of a work so greatly wanted, the Editors submit themselves to the candid judgment of the Public. The great outline of their plan is sufficiently obvious in the title page; and they trust, in that part of it which, after the example of a judicious cotemporary, consigns to a distinct alphabetical arrangement the almost innumerable, yet almost useless, technical terms, derived from the writings of the ancient physicians, &c. thereby affording room for a more ample and satisfactory account of subjects of much higher interest amongst the *sciences auxiliary to medicine*, as in chemistry, botany, &c. that they will appear to have at once consulted the reader's gratification and advantage, and justified the claim of their work to be considered as an "*Encyclopædia of Medical Knowledge*."

They are not so presumptuous, however, as to suppose their undertaking unexceptionable in all respects: indeed they have been convinced of the contrary, by the candid and friendly warnings of judicious individuals in the course of its publication; warnings, of which, it will be perceived, a good use has been made in the present, and will be more particularly attended to in the subsequent, impressions.

The obvious and almost unbounded obligations of a work of this sort, to medical literature, supersedes the necessity of distinctly acknowledging the sources from which the great

mass of its information has been derived: indeed, the task, however justly due, would be impracticable. The great luminaries of the Edinburgh School (as their title implies) have been first consulted; but neither have the eminent authors of South Britain been left unexplored, nor those of the continental Schools, in so far as they were at all capable of adaptation to the most prevailing medical notions at home. The hypotheses of Drs. Brown, Darwin, Beddoes, &c. though disputed on good grounds as to their validity, were too popular, particularly the first, to be wholly overlooked; but it is hoped the room they occupy, will not appear unreasonable, even to those with whose sentiments they are not in unison: something is due even to ingenious conjecture in the present state of medical knowledge.

It is necessary here to observe, that some articles of medical biography have been introduced. This, however, is to a very limited extent, and confined chiefly to the ancient writers whose medical opinions, though in most instances eclipsed by modern ingenuity, are at least worth preserving, as curious portions of medical history; to say nothing of the immortal precepts of the Father of Medicine, which even now demand our reverence, and preserve much of their original lustre and utility amidst the blaze of modern discovery.

Lastly, the editors hope, that the mode, principally adopted, of exhibiting the various subjects contained in the plates, *by shaded outlines, and finishing where the case seemed to require it*, will be found to answer the purposes of illustration better than the common mode, of *finishing badly, the whole of each subject.*

DIRECTIONS TO THE BINDER.

Vol. I. The Introduction to follow the Title. The volume closes with a single leaf, 5 F.

Vol. II. The single leaf, 4 D, is to be followed by sheet A; and the half sheet Z z by the Glossary, sheet a, &c.

Place the engravings together at the end of their respective volumes.

THE EDINBURGH

MEDICAL AND PHYSICAL DICTIONARY.

A, otherwise written ĀĀ, or ANA, (from ἀνὰ, which signifies *of each);* a term in pharmacy. It is never used but after the mention of two or more ingredients, when it implies that the quantity mentioned of each ingredient should be taken, *e. g.* ℞. *Pulv. Jallap.—Crem. Tart. āā* ℥j. *i. e.* take jallap in powder, and cream of tartar, of each one drachm.

ABBREVIATION, *(Abbreviatio)*. The most principal uses of medicinal abbreviation are in prescriptions; in which they are certain marks, or half words used by physicians for dispatch and convenience when they prescribe,—thus ℞ readily supplies the place of *recipe— h. s.* that of *hora somni —n. m.* that of *nucis moschatæ—elect.* that of *electuarium*, &c. and in general all the names of compound medicines, with the several ingredients, are frequently written only up to their first or second syllable, or sometimes to their third or fourth, to make them clear and expressive. Thus *Croc. Angl.* stands for *Crocus Anglicanus—Cons. Cynosb.* for *Conservus Cynosbati*, &c. A point being always at the end of such syllables in medicine, shews the word to be incomplete.

ABDO'MEN, (from *abdo* to hide, because it hides the viscera; or derived from *abdere* to hide, and *omentum*, the caul. By others it is said to be only a termination, as from *lego*, *legumen*, so from *abdo*, *abdomen).* The abdomen is the largest cavity in the body. It is bounded superiorly by the diaphragm, by which it is separated from the chest; inferiorly by the bones of the pubis and *ischium;* on each side by various muscles, the short ribs and *ossa ilii;* anteriorly by the abdominal muscles, and posteriorly by the vertebræ of the loins, the *os sacrum*, and *os coccygis*. Internally it is invested by the *peritoneum*, and externally by muscles and common integuments.

In this cavity are contained the following parts:

1*st. Anteriorly* and *laterally.*

1. The mesentery.
2. The omentum
3. The stomach.
4. The large and small intestines.
5. The lacteal vessels.
6. The pancreas.
7. The spleen.
8. The Liver and gall bladder.

2*dly. Posteriorly, without the peritoneum*, are found,

1. The kidneys.
2. The supra renal glands.
3. The ureters.
4. The *receptaculum chyli.*
5. The descending aorta.
6. The ascending vena cava.

3*dly. Inferiorly in the pelvis*, and also *without the peritoneum.*

In men,

1. The urinary bladder.
2. The spermatic vessels.
3. The *intestinum rectum.*

In women, besides the urinary bladder and *intestinum rectum*, the following parts are found:

1. The *uterus*, or womb.
2. The four ligaments of the *uterus.*
3. The two *ovaria.*
4. The two Fallopian tubes.
5. The *vagina.*

In the centre of the fore part of this cavity, is the navel. The *abdomen*, properly so called, is distinguished by anatomists into regions. See EPIGASTRIC, HYPOCHONDRIAC, UMBILICAL, and HYPOGASTRIC REGIONS.

The posterior part of the abdomen is called the loins or reins, and the sides are named the *Epicolic regions.*

Galen held the action of the abdominal muscles necessary to the act of expiration, as they pull down the thorax, and are very useful in efforts to speak loud. He also says, that without their action we could have no stool, nor void urine; for the actions of the sphincter muscles of the anus and of the bladder are in a great measure overcome by the actions of the abdominal muscles and diaphragm. He farther observes, in his work De Locis Affectis, that some people who find a difficulty in going to stool, or have a suppression of urine, relieve themselves by pressing the abdomen with their hands: and that the expulsion of the fœtus is the work of the abdominal muscles. Mr. Pott was of the same opinion. He said, that he had seen a child, which lived nearly three weeks, though it had no abdominal muscles; that this child could not either propel or expel the fæces nor urine perfectly, without artificial aid. Besides it has been proved, that they are greatly instrumental in promoting the action of vomiting, by Dr. Haighton, in the second volume of the Medical Memoirs of London—for the most violent stimuli, when applied to the stomach either externally or internally, were, in his experiments, insufficient to produce a regurgitation of its contents, without the concurring efforts of the diaphragm, and muscles of the abdomen.

There is a sinus on each side of the xiphoid cartilage, between the transversalis and recti muscles, into which, on the left side, the stomach is sometimes pushed by violent vomiting, which disease is called Gastrocele. The tumour is in the upper part of the linea alba. The disorder is attended with excessive pain, which is greater when the person is up, and gradually goes off when he lies in a horizontal posture, which circumstance is the pathognomonic sign of the disease. There is a continual vomiting; every thing taken in is immediately rejected; and from hence succeeds an atrophy. All hernias of the linea alba require the same management; but this of the stomach requires particular attention. It is easily reduced, and should be kept up by a truss: happily this case is very rare. When it occurs, little more can be done than to alleviate general symptoms; for if it cannot be returned by the hand, any operation will be a doubtful remedy.

Pain, and other disorders of the belly, sometimes happen from cold; though these are rather referable to its contents, than to the abdomen itself. The circulation of the blood from the viscera in the belly, by the vena portæ to the liver, and afterwards in the liver, is greatly promoted by the alternate compression, which the contents of the belly receive from its muscles, and the diaphragm above. Hence it follows, that in proportion as the action of the muscles of the belly is impaired, this circulation, so necessary to the animal œconomy, must be obstructed.

The muscles of the belly and other of the internal parts are subject to inflammations, which have been mistaken for inflammation in the liver, &c. It is therefore necessary to distinguish them, by attending to the concomitant affections. See Hepatitis; also inflammation.

The rheumatism sometimes affects the muscles of the belly, which have been mistaken for colic, or for inflammation of the viscera. In this last case, however, the usual symptoms of inflamed viscera are absent, and the medicines which are useful in the colic are without effect in this affection.

For the management of wounds in the belly, see the article Wounds.

ABDOMEN, PENDULOUS. In consequence of their extreme distention, the muscles of the *abdomen* are often the seat of pain during pregnancy, especially at their insertions. Dr. Denman says, it requires some attention to distinguish this from the pain which may arise from affections of the *symphysis* of the *ossa pubis*. When the weight of the *abdomen* in pregnant women is very great, and weakly supported by the integuments, it becomes *pendulous*, and occasions to the patient much pain and difficulty in walking, and many other inconveniencies. In this case, a napkin or broad bandage, should be passed round the lower part and middle of the *abdomen*, to support it with a moderate degree of firmness, and afterwards a scapulary to sling the depending weight over the shoulders, by which means the patient will be enabled to move and walk about with infinitely less trouble, and any inconvenience thence arising will be removed.

ABDOMINAL HERNIA. See Hernia. A tumour situated on the external part of the abdomen, arising from the protrusion of part of its viscera, not through any natural opening, but through the interstices of the muscles, by the parting or distension of muscular fibres, from weakness, or from an accidental wound of the part.

ABDOMINAL MUSCLES. See Muscles.

ABDOMINAL RING. An oblong, tendinous opening in both groins, through which the spermatic cord in men, and the round ligaments of the uterus of women, pass. It is through this opening that the intestine or omentum falls in a rupture, forming that species of hernia called *bubonocele*. See Obliquus externus abdominis.

ABDU'CENT, (from *abduco, to draw from)*, an epithet applied to certain muscles, which serve to open or pull back any part of the body; their opposites being called *adducent*, from *adduco, to draw to*.

ABDUCENT NERVES, the sixth pair of nerves; so called because they go to the rectus externus oculi, which muscle was formerly termed *abducent*. They arise from the *medulla oblongata*, between the *corpora pyramidalia* and *pons varolii*. They then proceed forwards, perforate the dura mater, and go out of the cranium through the superior orbital

fissure, and are distributed in the *rectus externus* muscle of the eye-ball.

ABDU'CTOR, (from *ab* and *duco* to draw); a name given to a muscle which pulls back any part of the body into which it is inserted.

ABDUCTOR INDICIS MANUS; the *Abductor indicis proprius, semi-interosseus* of Winslow; an internal interosseous muscle of the forefinger, situated on the hand. It arises from the superior part of the metacarpal bone and the *os trapezium* on its inside, by a fleshy beginning, runs towards the metacarpal bone of the forefinger, adheres to it, and is connected by a broad tendon to the superior part of the first phalanx of the forefinger. Sometimes it arises by a double tendon. Its use is to draw the forefinger from the rest towards the thumb, and to bend it somewhat towards the palm.

ABDUCTOR INDICIS PEDIS; an interosseous muscle of the fore toe, which arises tendinous and fleshy by two origins from the root of the inside of the metatarsal bone of the fore toe; from the outside of the root of the metatarsal bone of the great toe, and from the *os cuneiforme internum*; and is inserted, tendinous, into the inside of the root of the first joint of the fore toe. Its use is to pull the fore toe inwards from the rest of the small toes.

ABDUCTOR LONGUS POLLICIS MANUS. See EXTENSOR OSSIS METACARPI POLLICIS MANUS.

ABDUCTOR MEDII DIGITI PEDIS; an internal interosseous muscle of the foot, which arises tendinous and fleshy from the inside of the root of the metatarsal bone of the middle toe internally, and is inserted, tendinous, into the inside of the root of the first joint of the middle toe. Its use is to pull the middle toe inwards.

ABDUCTOR MINIMI DIGITI MANUS; the *Hypothenar* of Riolan and Winslow, and *Extensor tertii internodii minimi digiti* of Douglas. *Flexor parvus minimi digiti.* It is a muscle of the little finger situated on the hand. It arises fleshy from the pisiform bone and from that part of the *ligamentum carpi annulare* next to it, and is inserted, tendinous, into the inside of the upper end of the first bone of the little finger. Its use is to draw the little finger from the adjoining one.

ABDUCTOR MINIMI DIGITI PEDIS, the *Parathenar major* and *Metatarseus* of Winslow; a muscle of the little toe, which arises tendinous and fleshy from the semicircular edge of a cavity on the inferior part of the protuberance of the os calcis, and from the rest of the metatarsal bone of the little toe, and is inserted into the root of the first joint of the little toe externally. Its use is to bend the little toe and its metatarsal bone downwards, and to draw the little toe aside from the rest.

ABDUCTOR OCULI, i. e. *Rectus externus oculi*, which see.

ABDUCTOR POLLICIS MANUS, *Abductor Thenar Riolani* of Douglas; a muscle of the thumb. It is situated on the hand, arises by a broad tendinous and fleshy beginning from the *ligamentum carpi annulare* and from the *os trapezium*, and inserted, tendinous, into the outer side of the root of the first bone of the thumb. It draws the thumb from the fingers. Albinus names the inner portion of this muscle, *abductor brevis alter*.

ABDUCTOR POLLICIS PEDIS, the *Thenar* of Winslow; a muscle of the great toe situated on the foot. It arises fleshy from the inside of the root of the protuberance of the os calcis, where it forms the heel, and tendinous from the same bone where it joins the *os naviculare*. It is inserted, tendinous, into the internal sesamoid bone and root of the first joint of the great toe. Its use is to pull the great toe from the rest.

ABDUCTOR TERTII DIGITI PEDIS; an interosseous muscle of the foot that arises tendinous and fleshy from the inside and inferior part of the root of the metatarsal bone of the third toe; and is inserted, tendinous, into the inside of the root of the first joint of the third toe. Its use is to pull the third toe inwards.

A'BIES, the FIR-TREE; an evergreen, and coniferous, with numerous narrow, stiff leaves, standing solitary or unconnected at their bases with one another. Botanists have enumerated twelve species, if not more; but the four which follow are the chief that afford materials for medical use. Linnæus includes the *abies* in the genus of PINUS.

1. The COMMON RED FIR, OR PITCH TREE, with a reddish bark, long, slender, quadrangular, sharp-pointed leaves, and long cones hanging downward. It is the *pinus abies picea* Linn.

2. The YEW-LEAVED, OR SILVER FIR, with a whitish bark, roundish pointed leaves, a little cloven at their tops, and short cones standing upward; the leaves being marked on the lower side with three green lines and two white depressions. This is the *pinus abies alba* Linn.

These two species are natives of the north: the second grows on dry mountainous places; the first in lower and moister grounds. They are indigenous in some parts of Britain. The branches, and the fruit gathered in autumn, abound with a resinous matter, and yield, on distillation, an essential oil, and an acid liquor. Shavings of the wood, when added to water, communicate to it both the flavour and other properties of tar; and this infusion has produced good effects in some obstinate coughs, particularly in that chronic catarrh which is benefited by diuretics. Decoctions of the wood and tops promote perspiration and urine; are useful in some rheumatic cases; and have the common effects of turpentine in stimulating the urinary passages. They are improper, however, where any degree of febrile affection exists, as they are apt to encrease

the natural heat; but they are highly useful where the system is torpid, and where too languid a circulation of the fluids is the cause of disease.

3. The Canada or Virginian fir, with roundish pointed leaves, sometimes cloven, standing like the teeth of a comb in two rows on each side of the branches, and variegated underneath, with a double line of whitish dots. It is the *pinus abies Canadensis* Linn.

4. The Balm of Gilead fir; so called from the fragrance of the leaves when rubbed. The leaves are roundish pointed, and slightly cloven, nearly like those of the silver fir; the cones are long and pointed, and stand erect. It is the *pinus abies balsamea* Linn.

All the parts of these trees contain a resinous juice, impregnated with a bitterish, pungent, essential oil. Turpentines are obtained from them by making incisions in their trunks at a proper season. For the different kinds of turpentine, see Turpentines.

The common red fir affords the greatest quantity of turpentine; and from the turpentine is obtained white resin, tar, pitch, and Burgundy pitch. See those articles.

ABIES CANADENSIS. See Balsamum Canadense.

ABLACTATION, (*Ablactatio*, from *ab*, from, and *lac*, milk); weaning, or taking a child from the milk of the breast. When the mother wants health or strength; has too small nipples, or ill formed ones; when the infant will not take the breast; the mother's milk is bad or in too small a quantity; when the mother, having weak nerves, is apt easily to be surprised; these defects spoil the milk, and render it advisable to wean the child. It can never be useful to continue the breast more than eight or nine months; but generally, if a child is favoured with a good supply, by sucking, during its first three or four months, and is in a tolerably healthful state, it will rarely be the worse for weaning at this early period; so that if difficulties attend its being suckled, there need not be any hesitation about taking it from the breast. If it feeds tolerably with the spoon, and is free from disorders in its bowels, a tendency to convulsions, &c. weaning may be attempted at any time. But, if feeding with the spoon is difficult; if the child is much subject to the gripes, &c. another nurse should be sought for, and weaning must be deferred until more favourable circumstances attend. In general, the sooner a child is weaned, the more easy it parts with the breast. Prudence directs to accustom infants to early feeding with the spoon, and to continue the same until the breast may be wholly omitted. They should only be fed once in six hours, at the most, during the first two months; and should be entirely weaned from the breast, and from all feeding in the night; for night-feeding bloats them, and, if they are not used to it in the first week, they will never want it: if they are not disturbed from their birth, in a week or two, they will be formed to a habit of sleeping most of the night very quietly.

The food should be simple and light; not mixed with sugar, wine, and such like additions, for these produce the diseases with which children are most troubled, acidities in the *primæ viæ*. Unfermented flour makes a viscid food that turns sour before it digests, and well-fermented bread even turns sour; but if this latter is made into fresh panada every night and morning, or, in cool weather, every morning, the inconvenience of souring is prevented. To avoid acidity in the child's stomach by a daily use of vegetable food, give now and then a little tea, or broth, made of either veal, mutton, or beef, once or twice in the day; suppose, for example, a mixture of equal parts of the gravy which is discharged in cutting a joint that is brought hot on the table, and warm water, to which may be added a little salt, and thus an excellent broth is readily made. This diet is of the most nourishing kind. Cow's milk, a little diluted with water, is an excellent substitute for the mother's; yet, as it is apt to turn sour, add to it a little Magnesia. Rice is not so apt to turn sour as wheat bread is; it therefore would be a more convenient food for children, and deserves to be attended to. Toasted bread boiled in water till it is almost dry, then mixed with fresh milk, not boiled, is an agreeable change. As the teeth advance, the diet may increase in its solidity. As to the quantity, let the appetite be the measure of it; observing to satisfy hunger, but no more, which may be thus managed; feed the child no longer than he eats with a degree of eagerness. In feeding, let the child be held in a sitting posture, and thus continue it until the stomach has nearly digested its contents. The practice of violently dancing and shaking the child should be avoided, though moderate exercise is essentially necessary.—Keep the child awake until it breaks wind after each time it is fed; divert it during the day as much as you can, and thus it will soon lie quiet all the night. Never awaken a child when it is asleep, for thus sickness and peevishness are often produced. As soon as teeth appear, give the child now and then a piece of flesh meat or soft bone to chew; but never give it any confectionaries.

ABLUENTS, (*Abluentia*, *sc. medicamenta*, from *abluo*, to wash away.) also called *Abstergents*. Medicines which were formerly supposed to purify or cleanse the blood.

ABORTION, (*Abortio*, from *aborior*, to be steril); the expulsion of the fœtus from the uterus, commonly called a miscarriage. A distinction, not very necessary, has been made between abortion which is accidental or *spontaneous*, and that which is procured by art or contrivance, which last is called

artificial abortion. It may not be improper, however, to consider them separately.

Spontaneous abortion—When the embryo or fœtus is thrown off by a woman in early gestation, it is considered properly as an abortion; but, if this happen in the latter months, authors term it a *premature birth.*

The symptoms that threaten abortion are these:

Flooding from the uterus.

Pains in the back and belly.

Bearing-down pains, with regular intermissions.

The evacuation of the waters. Lastly

The death of the child, which discovers itself by the following symptoms; though, in general, these are so doubtful and fallacious, that none of them afford an infallible sign:

1. The subsiding of the abdominal tumor.
2. Cessation of motion in the fœtus.
3. The sensation of a heavy weight falling from side to side, as the woman turns herself in bed.
4. Sickness, faintings, rigors, cold sweats.
5. The breasts turning flaccid.
6. Coldness of the abdomen, and putrid discharge from the vagina.

Abortions are seldom dangerous in the first five months; but a frequent habit of miscarriage debilitates the system, shatters the constitution, and lays the foundation of chronic diseases of the most obstinate and dangerous nature.

In the advanced months, the prognosis will be more or less favourable according to the patient's former state of health, the occasional cause, and symptoms with which it is attended. The proximate cause of abortion is the same with that of true labour, viz. a contracting effort of the uterus and abdominal muscles, assisted by the other expulsive powers. The remote causes cannot be explained with precision; as many circumstances, with regard to the nature of impregnation, and connection of the fœtus with the placenta and uterus, are subjects still involved in darkness. They may in general, however, be reduced,

I. To whatever interrupts the regular circulation between the uterus and placenta.

II. To every cause that excites the spasmodic contraction of the uterus, or other assisting powers.

III. To whatever occasions the extinction of life in the fœtus.

Amongst the first are:

1. Diseases of the uterus.
2. Imperviousness or spasmodic constriction of the extremities of the uterine blood-vessels.
3. Partial or total separation of the placenta or chorion from the uterus.
4. Determination to other parts.

To the second general head belong all causes that produce a strong contraction of the elastic fibres of the uterus, or of the parts that can press upon it, or that occasion a rupture of the membranes; such as,

1. Violent agitation of mind or body.
2. A disease of the membranes.
3. Too large a quantity of liquor amnii.
4. The cross position of the fœtus.
5. Its motion and kicking.

The last head includes the numerous causes of the death of the child, which, besides those referred to in the preceding classes, may be occasioned by,

1. Diseases peculiar to itself.
2. Diseases communicated by the parents.
3. External accidents happening to the mother: or,
4. Accidents incident to the fœtus in utero.
5. Diseases of the placenta or funis.
6. Knots and circumvolutions of the latter.
7. Too weak an adhesion of placenta or chorion to the uterus; and,
8. Every force that tends to weaken or destroy this attachment.

In consequence of the great abridgment of the human race by abortion, and the ill health it induces to those unfortunate females who become subject to it, the late Dr. Hunter bestowed infinite pains to investigate its cause, and to check its progress. He dissected three abortions, which happened at the most usual time women are subject to this misfortune, namely, towards the end of the third month; whence it appeared, that there is an extinction of life in the fœtus for some time before any symptoms of abortion occur. For instance, if the miscarriage happens about the end of the third month, the age of the fœtus is generally no more than eight or nine weeks; or, if it perishes in the fifth, sixth, or seventh month, it will still be retained in the uterus, and the expulsion will rarely happen until near the completion of its full time.

Dr. Hunter made several useful discoveries relative to the human pregnant uterus, as well as his brother, Mr. John Hunter. See the article Placenta. Dr. Hunter concluded, that a careful investigation of the minuter vessels of the uterine system, with their ramifications, would be the likeliest means of obtaining satisfactory information on this delicate subject. This also led him to the discovery of the *decidua*, which is a membrane of a very peculiar nature, the knowledge of which throws great light upon the contents of the pregnant womb, and upon the connection between the mother and child. It appears to be an efflorescence of the internal coat of the uterus; and is therefore shed as often as the woman bears a child, or suffers a miscarriage. It consists of two parts, called decidua vera, and decidua reflexa. In separating it from the chorion, and from the muscular fibres of the uterus, an infinite number of small veins and arteries are discovered full of blood, which ramify from its outer surface inwards through its whole substance,

blending itself inseparably with the umbilical portion of the placenta. Its principal arteries run in winding convolutions, like the coiling of a snake, forming an appearance much resembling that of lace; and considering the number and size of the vessels, which are necessarily broken upon the expulsion of the fœtus, we cannot longer wonder at those frequent fatal bleedings which accompany miscarriages in an advanced state of pregnancy. The subjects of these curious and masterly dissections are represented in Plate I. of which the following is an explanation:

Fig. 1. An abortion of about nine weeks old, seen on that side which is membranous. The decidua is torn, and turned somewhat aside, to shew the smooth and opaque decidua reflexa. A, the rough external surface of the decidua, which exfoliated from the womb. B, the outside of a small portion of the placenta, the rest of which was situated on the back part of this subject. CC, the internal cribriform surface of the decidua, which, in the first months of pregnancy, does not adhere to the membranes which it encloses. DD, the lacerated edge of the decidua, which had been continued into the edge EE of the same membrane. F, the decidua reflexa, spread over the outside of the chorion. GG, the angle of reflection at the edge of the placenta, where the inner layer of the decidua is turned over the chorion; much in the same manner as the inner lamella of the pericardium is reflected, to cover the outer surface of the heart. H, the termination of the decidua at the cervix uteri.

Fig. 2, shews a vertical section of the same subject. AA, the section of the placenta, which, we must suppose, had adhered to the upper and back part of the womb. B, the section of the anterior portion of the decidua. C, the section of the posterior portion of the decidua. D, the termination of the decidua at the cervix uteri. E, the cavity of the amnion, in which the embryo hangs by a slender navel-string, from the inside of the placenta. F, the section of the three membranes, which are not only contiguous, but adhere to one another, viz. the amnion, the chorion, and the decidua reflexa. GG, the angle at the edge of the placenta, where the inner layer of the decidua is reflected over the outside of the chorion. H; here those three membranes are a little separated, to shew their course at the placenta.

Fig. 3, represents an abortion of about eight weeks old. A small strap of the decidua is cut out, and turned up, to shew the cavity between it and the other membranes. A, the cut slip of the decidua. B, the part of the conception where there is no decidua, viz. opposite to the passage through the cervix uteri. CC, the external surface of the decidua. D, the decidua reflexa covering the chorion and amnion, which fill up the cavity of the decidua. E, the outside of the upper part of the placenta.

Fig. 4, represents the same subject, when the decidua had been opened by a crucial incision, and the four angles had been turned off, and then a round piece of the decidua reflexa dissected off, and turned to one side, to shew the loose vessels on the outside of the chorion. AA, the inside of the four angles or flaps into which the decidua was reduced by crucial incision. BB, the decidua reflexa covering the other membranes. C, the angle at the edge of the placenta, where the interior lamella of the decidua is continued over the outside of the chorion, forming the decidua reflexa. D, a round portion of the decidua reflexa, dissected from the outside of the chorion and turning aside. E, the chorion, with its shaggy vessels, laid bare. These vessels adhered firmly to the decidua reflexa, and parts of them were cut off with that membrane.

Fig. 5, shews an abortion of the same age, consisting of the chorion only, with its vessels and contents; that is, without the decidua, or uterine part of the secundines. A, the larger and more crowded branches of the shaggy vessels which shoot from the external surface of one part of the chorion, to mix with the decidua, or uterine part, to form the placenta. B, that portion of the chorion which afterwards becomes the uniform transparent membrane. It is covered with fewer and more delicate floating vessels, which lose themselves in the decidua reflexa. The embryo is seen through it. C, the vesicula umbilicalis on the outside of the amnion, seen through the chorion; with a whitish thread (the remains of an artery and vein), leading from it towards the navel of the embryo.

Fig. 6, represents the same abortion opened. The membranes, which were at the fore-part, being cut from the placenta, and turned up, the embryo is distinctly seen. A, the vesicula umbilicalis, from which B, the remains of an artery and vein, in the form of a white thread, pass to C, the navel of the embryo, with some turns of the intestines lodged in the beginning of the navel-string.

Dr. Hunter has given to the public an instance of abortion in advanced pregnancy, where the death of the fœtus seems to have taken place in the fifth and sixth month, by being entangled in its navel-string; and the mother died from the violence of the hæmorrhage. Dr. Hunter on this occasion remarks, that he never before observed an instance of any injury either to the mother or child, in consequence of the navel-string being twisted in coils round the neck of the fœtus. He once saw it turned four times and a half round the neck without the smallest inconvenience; from which he infers, that in such cases there is a proportionable redundancy of length in the string, and the child's head gravitating towards it, might be

caught in its coils, without occasioning such a constriction or knot as would impede the circulation through it. In the present case, however, the navel-string formed a convolution at the same time round the neck, and round the leg, of the child, in a position that precluded every possibility of its receiving the smallest nourishment from the mother. In Plate II. is given a correct representation of this interesting subject, shewing the full size of the fœtus, with the decidua reflexa upon the chorion, through which the child appears, and of which the following is an explanation: A, the rugous inside of the neck of the womb seen through the transparent covering. B, the substance, both of the womb and of the decidua, cut through. C, the decidua reflexa, covering the transparent membranes, in white and opaque striæ. It was become so thin by extension, as to be rendered almost transparent in many places. It has not as yet contracted an adhesion with the decidua which covered it. D, a convoluted artery, branching through the decidua reflexa, from the edge of the placenta. E, a vein of the same kind. F, a turn of the navel-string round the child's neck. G, a convolution of the same round its leg. The cutaneous vessels of the child were as distinctly filled with blood, as if they had been injected.

Abortion is not easily prevented, as it is often preceded by no apparent symptom, till the rupture of the membranes, and evacuation of the waters, announce the approaching expulsion of the fœtus: Either to remove threatening symptoms, or to prevent miscarriage when there is reason to apprehend it, often baffles our utmost skill; because it generally happens, that there is a cessation of growth in the ovum; or, in other words, an extinction of life in the fœtus, some time previous to any appearance of abortion. For instance, in early gestation, a woman commonly miscarries about the 11th or 12th week; but the age of the fœtus at this time is generally no more than eight weeks. At other times, when by accident the fœtus perishes, perhaps about the fifth or sixth month, it will still be retained in utero, and the expulsion will not happen till near the completion of full time.

As women who have once aborted are so liable to a recurrence from a like cause, at the same particular period, such an accident, in future pregnancies, should therefore be guarded against with the utmost caution. On the first appearance of threatening symptoms, the patient should be confined to a horizontal posture; her diet should be light and cooling; her mind should be kept as tranquil as possible; a little blood from the arm may be taken occasionally; and opiates administered according to circumstances: but excepting so far as depends on these, and such like precautions, for the most part, in the way of medicine, very little can be done.

Manual assistance is seldom or never necessary during the first five months of pregnancy: the exclusion of fœtus and placenta should very generally be trusted to nature.

The medical treatment of abortion must therefore be considered with a view only to the prophylactic cure: and this again will chiefly consist in a proper attention to diet.

Mr. Lucas, of Leeds, has published some observations on the means of *prevention in future gestations*, in which he says, that, as the occasional causes of abortion are seldom suddenly succeeded by the symptoms which immediately produce it, the preventive means are generally applied too late to be of material advantage. After a woman has been subject to miscarriage, unless when it has happened from an external injury, there seems to be a peculiar disposition to it about *the same period of the next pregnancy;* and even from such slight causes as a fit of laughter. Mr. Lucas observes, that those women who have never miscarried are so little liable to abortion, that attempts to procure it have often rather endangered the life of the mother than accomplished the baneful design. In proof of this, he cites the case of a patient who had taken about a drachm of powdered cantharides, which brought on frequent vomiting, violent spurious pains, a tenesmus, and immoderate diuresis, succeeded by an acute fever, which reduced her to extreme weakness. No signs of miscarriage, however, appeared; but, in about five months after, the woman was delivered of a healthy child.

When the time of pregnancy is far advanced, abortion is not to be procured by artificial means without extreme danger; for the fœtus being large, and the means violent, a profuse hæmorrhage precedes and ensues, attended with convulsions, fever, and perhaps a mortification of the womb. Yet every woman, during the whole time of her pregnancy, is more or less in danger of abortion; and therefore she should guard against it with the utmost care and circumspection, especially in the latter months, when it cannot happen, even by accidental means, but at the hazard of her life. In these advanced stages, the pains are much the same, and sometimes more violent, than those of labour; manual assistance in such cases frequently becomes necessary.

With respect to the treatment, it is evident, that this must be varied according to the particular circumstances of the case; nor is it possible to point out particular indications, where the causes are so various.

The preventive means recommended consist "in strengthening the habit previous to a subsequent pregnancy; in taking away a few ounces of blood a week or two before that period of gestation at which the last miscarriage had happened; in advising a more abstemious or less nutritive diet; and

in prohibiting the use of fermented liquors, or of any severe exercise, especially such as may effect the parts more immediately concerned."

Artificial abortion.—With cases of artificial abortion, the medical practitioner has nothing to do, further than as an early knowledge of the means employed to procure it may enable him to counteract them, and preserve the lives of the mother and child.

Every woman who attempts to procure an abortion, does it at the hazard of her life; yet there are not a few who run this risk, either to prevent shame, or the trouble of bearing and bringing up children. It is a most unnatural crime, and cannot, even in the most abandoned, be viewed without horror; but, in a person of decent conduct in other respects, it is still more unpardonable. Those wretches who daily advertise their assistance to women in this business, deserve the most severe of all human punishments. The ancient Greek legislators, Solon and Lycurgus, prohibited the practice of creating abortion under the severest pains and penalties. Whether or no it was permitted among the Romans, has been much disputed between two learned modern civilians. It is certain the practice, which was by them called *visceribus vim inferre*, was frequent enough: but whether there was any penalty on it, before the emperors Severus and Antonine, is the question. Noodt maintains the negative; and further, that those princes only made it criminal in one particular case, viz. of a married woman's practising it out of resentment against her husband, in order to defraud him of the comfort of children: this was ordered to be punished by a temporary exile: *siqua prægnans vim visceribus suis intulerit ne inimico marito filium procrearet, temporali exilio coerceatur.* He adds, that there was no general prohibition of the practice before Gratian and Valens. It is true, we find in Cicero an earlier instance of a woman punished for this fact; but it was in Milesia, a country not subject to the Roman laws. Bynkershoeck, however, denies that a woman was allowed to drink the *poculum abortionis, impune;* and the reason he gives, is, that the womb was the husband's property, who was declared by the laws the sole custos of it; to prevent being imposed upon in the children he was necessitated to bring up. But then this does not affect women who had been impregnated by others than their husbands. The foundation on which the practice is said to have been allowed, was this: the fœtus, while in utero, was reputed a part of the mother, and ranked as one of her own viscera, over which she had the same power as over the rest; besides that the embryo was not reputed as a man, *homo;* nor to be alive, otherwise than as a vegetable; consequently, the crime was said to amount to little more than plucking unripe fruit from a tree. Vide *Juven. Sat.* 6. v. 500. *Senec. Consolat. ad Helviam Matrem*, cap. 16. This last-cited author represents it as a peculiar glory of Helvia, that she had never, like other women, whose chief study is their beauty and shape, destroyed the fœtus in her womb.

The primitive fathers, Athenagoras, Tertullian, Minutius Felix, Augustin, &c. declaimed loudly and justly, against the practice, as virtual murder: *Homicidii festinatio est, prohibere nasci; nec refert natam quis eripiat animam, an nascentem disturbet.* Several councils have declared against it. Yet we are told that the modern Romish ecclesiastical laws allow of dispensations for it; and Egane even mentions the *rates* at which a dispensation for it may be had.

The practice of artificial abortion is chiefly in the hands of women and nurses, rarely in that of physicians; who, in some countries, are not admitted to the profession without abjuring it. Hippocrates, in the oath he would have enjoined on all physicians, includes their not giving the *possus abortivus;* though elsewhere he gives the formal process, whereby he himself procured a girl to miscarry. The time for it is presently after impregnation, at least within the third or fourth month of gestation. The manner of effecting it is chiefly by medicines of the purgative and deobstruent kind. Roman authors speak of the *poculum abortionis*, or abortive draught, frequent among them. External violences are also sometimes had recourse to, as leaping from a stool, prescribed by Hippocrates. Obstinate fastings, and vehement evacuations, have been frequently practised for the same end. Yet all the powers of medicine often fail to procure abortion, by reason of the naturally close contraction of the orifice of the uterus; which has been known to hold out against the most malignant fevers, dysenteries, salivations, and the like; against the strongest aperients and evacuants; against savin, succinum; against large quantities of *crocus metallorum*, mercury, the farina of *muscus terrestris*, &c. The most fatal method is by punctures of the uterus, with a pointed instrument for the purpose, too often used among us, and not unknown to the ancients. Patin mentions a midwife, hanged at Paris, for killing a fœtus in the womb, by running a stiletto, or kind of bodkin, up the vagina, through the orifice of the uterus; by which a miscarriage was produced, but with such ill success, that the mother was seized with convulsions, and died miserably. The criminal confessed she had treated many before in the same manner with good effect. Our own age and country affords a parallel instance, a woman having been some years ago executed among us for the like fact. Tertullian has a passage, which shews the same was practised in those days: *est etiam æneum spiculum, quo jugulatio ipsa dirigitur cæco latrocinio* εμβρυος-Φακτην *appellant, utique viventis infantis peremptorium.* The operation, considering the ten-

derness of the part, must be of the utmost danger. Brendelius gives an account of what he observed in dissecting a girl at Noremberg, in 1714, who died of the operation which she had performed on herself: the neck of the uterus appeared exceedingly distended, the vessels lacerated and mortified, and the uterus itself much inflamed.

Compulsory, or artificial, abortion, is sometimes justifiably resorted to in those miserable cases where a deformity of the pelvis absolutely precludes delivery. Cases of this kind are to be found in our modern books of midwifery, and are, highly worthy of attention. The means used are simple and gradual dilatation of the os uteri by the finger, and rupture of the membranes, after which the expulsion of the fœtus takes place by the efforts of nature. Such cases, however, from Dr. Denman's account, seem to require the most judicious and delicate management.

ABORTIVES; medicines capable of occasioning abortion. It is now generally believed, that the medicines which produce miscarriage, effect it by their violent action on the system, and not by any specific action on the uterus. See Abortion.

ABRASION, (from *abrado*, to tear off). This word is generally employed to signify the destruction of the natural surface of any membranous part, as the stomach, intestines, urinary bladder, &c. or to any external part slightly worn away by attrition, as the skin, &c.

ABROTANUM, (αϐροτανος, from α, neg. and ϐροτος, mortal, because it never decays; or rather from αϐρος, soft, and τονος, extension, from the delicacy of its texture). *Abrotanum mas;* common southern-wood. It is the *Artemisia abrotanum* Linn. *Artemisia fruticosa, foliis setaceis ramosissimus.* Class, *Syngenesia.* Order, *Polygamia superflua.* This plant is possessed of a strong and agreeable smell; but it has a pungent, bitter, and somewhat nauseous taste. It is supposed to stimulate the whole system, but more particularly the uterus; it is very rarely used unless by way of fomentation, with which intention the leaves are directed by the London College in the *decoctum pro fomento.*

ABROTANUM FEMINA, *Santolina*, common lavender cotton To this plant, *Santolina chamæcyparissus; pedunculis unifloris, foliis quadrifariam dentatis* Linn. antihysterical, anthelmintic, and deobstruent virtues are attributed. It may be employed in all cases as a substitute for the *abrotanummas.*

ABROTANUM MAS. See Abrotanum.

ABSCESS (*abscessus*, from *abs*, and *cedo*, *to retire*). The words ἀποστημα, aposteme, and αποστασις, impostumation, frequently used by Hippocrates, are translated by Celsus *abscessus*, and sometimes *vomica.* The word abscess is used by modern authors to signify a suppurated phlegmon or inflammatory tumor, though the foregoing words seem, originally, by their derivation, to import the exclusion of any morbific matter besides pus. Accordingly they are used by Hippocrates to express any critical removal of offending humours from the vital parts, either to some of the emunctories, for an immediate discharge, or to some part where they find an easy egress by the rupture of a blood-vessel, &c. Abscess, or, in other words, suppuration, is one of the terminations of inflammation. See Inflammation. If the common means for procuring resolution have been diligently employed, and if, in consequence of these, the heat, pain, and other attending symptoms, abate, and especially if the tumor begins to decrease, without the occurrence of any gangrenous appearances, we may then be almost certain that, by a continuance of the same plan, a total resolution will ultimately be effected.

But, on the contrary, if all the different symptoms rather increase; and especially if the tumor grows larger, and somewhat soft, with an increase of throbbing pain, accompanied with frequent cold shiverings, we may then with tolerable certainty conclude, that suppuration has taken place; and should therefore immediately desist from such applications as were judged proper while a cure was thought practicable by resolution, and endeavour to assist nature as much as possible in the formation of *pus*, or in what is called the *maturation* or ripeness of the tumor. Mr. Bell, and other writers, agree, that, for this purpose, there is nothing better than to preserve a proper degree of heat and moisture in the part. This is commonly done by means of warm fomentations and cataplasms; and when these are regularly and frequently renewed, nothing, it is probable, can more effectually answer the purpose. But in the ordinary manner in which they are applied, by the cataplasms being renewed only once, or at most twice a-day, they probably do less good than is imagined. For so soon as the degree of heat they were at first possessed of is dissipated, the evaporation which ensues, may render the part a great deal colder than if it had been merely wrapped in flannel, without the use of any such application.

In order to receive all the advantage of such remedies, the part affected should be well fomented with flannels pressed out of hot water, or any emollient decoction, applied as warm as the patient can easily bear them, continued at least half an hour at once, and repeated four times a day.

Immediately after the fomentation is over, a large emollient poultice should likewise be applied warm, and renewed every second or third hour at farthest. Of all the forms recommended for emollient cataplasms, a bread and water poultice, with a small portion of linseed meal, is perhaps the most eligible; as it not only possesses all the advantages

that can be desired, but can at all times be easily obtained.

Roasted onions, garlic, and other acrid substances, are frequently made use of as ingredients in maturating cataplasms. When there is not a due degree of inflammation in the tumor, and when it appears probable that the suppuration would be quickened by having the inflammatory disposition somewhat increased, the addition of such substances may then be of service. When stimulants are necessary in such cases, a small proportion of strained galbanum, or of any of the warm gums, dissolved in the yolk of an egg, and added to the common poultice, is a convenient and certain form of applying them. Whenever the inflammation, however, takes place to a proper degree, such stimulating substances never can be necessary; and in many cases they may even do mischief.

Tumors, possessed of little or no inflammation, are commonly said to be of a cold nature. These being generally indolent, and proceeding very slowly to suppuration, plasters composed of the warm gums are often had recourse to with considerable advantage. In such cases, the latter are not only of use by the stimulus and irritation they occasion, but by the heat which they tend to preserve in the part. They become particularly necessary when the patient, by being obliged to go abroad, cannot have cataplasms frequently enough renewed, or so conveniently applied; but when some such objection does not occur, the latter, for very obvious reasons, should always be preferred. The following remedies adapted to the cases of tumor last mentioned, are given in the Pharmacopœia Chirurgica:—

℞ Seminum cumini lib. j.
Baccarum lauri
Foliorum scordii exsiccatorum
Radicis serpentariæ Virginianæ sing. unc. iij.
Caryophyllorum aromaticorum unc. j.

These ingredients are to be powdered and formed into a cataplasm with thrice their weight of honey.

℞ Radicis lilii albi unc. iv.
Caricarum unc. j.
Radicis cepæ vulgaris contusæ unc. iss.
Galbani unc. ss.
Pulveris seminis lini, q. s.

The lily-roots and figs are to be boiled and bruised; the onions are to be afterwards added, and likewise the galbanum, previously rubbed with the yolk of an egg. This differs little from the old Edinburgh *cataplasma suppurans*, except in the omission of the yellow basilicon and oil of chamomile.

Dry cupping, as it is termed, that is, cupping without the use of the scarificator, upon or as near as possible to the part affected, is frequently had recourse to with advantage in promoting the suppuration of tumors. It is only, however, in such as these last mentioned, where there seems to be a deficiency of inflammation, that it can ever either be necessary or useful; but in all tumors of a really indolent nature, and where there is still some probability of a suppuration, no remedy is more effectual.

When *matter is fully formed* in a tumor, the abscess is complete; and this is known by a remission of all the symptoms taking place. The throbbing pain, which before was frequent, now goes off, and the patient complains of a more dull, constant, heavy pain: the tumor projects in a point at some particular part, generally near to its middle; where, if the matter be not encysted, or deep seated, a whitish yellow appearance is observed, instead of the deep red that formerly took place; and fluctuation of a fluid underneath is, upon pressure, very evidently discovered. Sometimes, indeed, when an abscess is thickly covered with muscular and other parts, though, from concurring circumstances, there can be little doubt of there being even a very considerable collection of matter, yet the fluctuation cannot be readily distinguished: it does not, however, often happen, that matter is so very deeply lodged as not to be discovered upon proper examination.

This, however, is a circumstance of the greatest consequence in practice, and deserves more attention than is commonly given to it. In no part of the surgeon's employment is experience of greater use to him than in the present case; and however singular it may appear, yet nothing more readily distinguishes a man of observation and extensive practice, than his being able easily to detect collections of deep-seated matter; whilst nothing, on the contrary, so materially affects the character of a surgeon, as his having, in such cases, given an inaccurate or unjust prognosis; as the event, in disorders of that nature, comes generally at last to be clearly demonstrated to all concerned.

Together with the several local symptoms of the presence of pus already enumerated, may be mentioned the frequent shiverings to which patients are liable on its first formation: these, however, seldom occur so as to be distinctly observed, unless the collection is considerable, or seated internally in some of the viscera.

After the matter is fully formed, and the abscess brought to maturity, the next step is to *open it*, and give vent to the pus it contains. In many cases, indeed, Nature will do the work, and abscesses, when superficially seated, will certainly burst of themselves; but where the matter lies deep, we are by no means to wait for this spontaneous opening, as the pus will acquire an acrimony before it can break through the integuments, which may prove very prejudicial to health. However, it is a general rule not to open abscesses till

a thorough suppuration has taken place; for, when laid open long before that period, and while any considerable hardness remains, they commonly prove more troublesome, and seldom heal so kindly.

In somes cases, however, it is necessary to deviate from this general rule, and to open them a good deal sooner. In all such critical abscesses as occur in malignant fevers, as in the plague, we are commonly advised to open such tumors, so soon as they are at all tolerably advanced, and not to wait till they are fully maturated; as, from experience in these disorders, it is found to be of more consequence, for the removal of the original disease, to have a quick discharge of matter produced, than any harm the patient can ever suffer from having a swelling somewhat prematurely laid open.

In abscesses, also, situated on any of the joints, or upon either of the large cavities of the breast and abdomen, and more especially when they seem to run deep, they should always be opened as soon as the least fluctuation of matter is discovered. For, when the resistance is on every side equal, they just as readily point inwardly as outwardly; and the consequence of a large abscess bursting into either of the large cavities, is well known most frequently to prove fatal: an instance of which is related by Mr. Bell.

There are three ways of opening an abscess so as to give an outlet to the matter, *viz.* by *caustic*, by *incision*, or by the introduction of a *seton.*

1. The first is most agreeable to timid patients, who are afraid of the pain of incision. Some *caustics* act slowly, and produce a long-continued pain, which arises from the impossibility of confining their action to a certain determinate extent. The caustic commonly called *lapis infernalis* is not so liable to this objection as the weaker kind, or *calx cum kali puro.* In applying the former, nothing is necessary but to twirl the caustic in contact with the skin, till the cuticle is removed and a *little* of the surface destroyed; after which a bit of dry lint may be applied, and secured with adhesive plaster. When left in this state till the following day, the eschar will be found either to have so penetrated the projecting point of the abscess as to afford an immediate outlet for some of the fluid, or if not, the pressure of the matter towards the surface will have been so much assisted, as to occasion a very speedy separation of that portion of the skin which the caustic has destroyed, and the cavity of the abscess will gradually be emptied. If, however, the milder caustic be preferred, the abscess is to have a slip of adhesive plaster applied to it, with a slit cut in it of a size somewhat less than the opening is intended to be. This slit is to be filled with the caustic reduced into a powder, and slightly wetted to make it act more quickly. It is then to be covered over with a plaster, and the whole secured with a firm compress and bandage. The time necessary for this to make a sufficient opening will depend upon the thickness of the skin and strength of the caustic; but generally it requires several hours. When we find that an eschar is made, it is to be softened with any emollient ointment until it can be readily separated; after which the matter is to be discharged, and the abscess treated as one opened by incision.

2. The method of opening abscesses by the *knife*, is to make an incision of such a size as to give free vent to the matter. The opening is to be made in the under part of the tumor, that the matter may pass readily out. It has been the practice among surgeons either to open a large abscess from end to end, or at least through two-thirds of its length, but from the bad consequences which often attend this method, the latest practitioners have thought it better merely to give a free discharge to the matter, without exposing the part to the action of the air.

3. The third method, *viz.* that by the *seton*, is now frequently employed. See Seton. It has the advantage of being attended with little pain, emptying the abscess in a gradual manner, and completely preventing the access of the air, which, in the other two methods, is often attended with bad consequences; and it frequently performs a cure in a much shorter time. There are various instruments for introducing the seton: it may even be done by a lancet and common probe; but the implements to be found represented in the plate annexed to the article Instruments, are more frequently employed. One of these being threaded with glover's soft silk, is to be introduced through the upper part of the tumor; but if the blunt one be employed, it will be necessary to have the assistance of a lancet, the instrument is then to be brought out at the under part of the tumor, and in this way the matter will be allowed to run gradually off.

The usual mode of *dressing an abscess* the first time is with dry lint. In the course of dressing, it will be proper to have regard to the situation of the abscess, and as much as possible to make the patient favour the discharge by his ordinary posture; and to this end also, the discharge must be assisted by compress and bandage: the compress may be made of soft old linen, applied according to the nature of the part. The frequency of dressing will depend on the quantity of discharge: once in twenty-four hours is ordinarily sufficient, but sometimes two, or perhaps three times, is necessary.

The late Mr. Hunter, speaking of the *treatment of inflammation* when *suppuration* has taken place, asserts, from his own experience, that suppuration does certainly sometimes stop, after having begun,

and that this shows there is a principle in the animal œconomy of diseases, from which the machine is capable of producing this consequence.

"I have formerly observed," says he, "that the inflammation goes off often without producing suppuration; and I have also mentioned instances of suppuration going off without the parts having produced granulations, and then the parts fall back into the adhesive state, and the matter being absorbed, they are left in nearly the same state as before the inflammation came on; as a presumptive proof of this, in many of the large cavities, which have been allowed to inflame and suppurate (by having been opened), we find them often doing well, without ever forming granulations; and that suppuration generally goes off; and I do not believe ever fall back into the adhesive state, so as to unite the parts, but the parts resume their original and natural state or disposition, and no adhesions are formed: this appears sometimes to happen in cases of the empyema after the operation has been performed. I have seen cases where wounds had been made into the cavity of the thorax, where there was every reason to suppose the whole cavity was in a state of suppuration, and yet these patients got well; I can hardly suppose that in these cases the parts had granulated and united in the cure, as the cellular membrane does; because I have seen many similar cases where the patients have died, and no granulations have been found; and I have seen cases of the hydrocele attempted to be cured radically by the caustic; when the slough came out, suppuration came on; but the orifice healing too soon, suppuration has ceased, and the cure was thought to be completed; but a return of the disease has led to another attempt, and by laying open the whole sac, it has been found that the tunica vaginalis was perfectly entire. In such, the fluid was a mothery serum. I have seen abscesses go back in the same manner: but I believe that this process is more common to scrofulous suppurations than any other; and, I believe, to the erysipelatous. I have seen joints heal after having suppurated and been opened, without having produced granulations, leaving a kind of joint, even when the cartilages have exfoliated from the ends of the bones, which was known by the grating of the two ends of the bones on one another."

The author asserts that he has seen buboes cured by vomits, after suppuration had been much advanced; and that it is no uncommon termination of scrofulous imposthumes:—"but in scrofulous abscesses we very seldom find inflammation; this process appears to be a leading circumstance in ulceration, which is the very reverse of union. Even in superficial sores, which are the most likely to continue suppuration, if excited, we find by allowing them to scab, when they will admit of it, that the act which admits of scabbing is the reverse of suppuration, and it ceases; however, it is a process which the animal œconomy does not readily accept of, and our powers in producing this effect are but very small: if these powers could be increased by any means, it would be a salutary discovery; because suppuration itself, in many cases, proves fatal; for instance, suppuration of the brain and its membranes; of the thorax and its contents, as well as of the abdomen and its contents; in short, suppuration of any of the vital parts often kills of itself, simply from the matter being produced: but this practice will by some be forbid in many cases of suppuration; for it is supposed this very suppuration is a deposit of matter or humours already formed in the constitution; but it is to be hoped that time and experience will get rid of such prejudices."

Mr. Hunter's injunctions as to the treatment when suppuration cannot be stopped or resolved, are the following:—"How far suppuration can be increased by medicine or application," says he, "I do not know; but attempts are generally made, and thence we have suppurating cataplasms, plasters, &c. recommended to us, which are composed of the warmer gums, seeds, &c. but I doubt very much if they have considerable effect in this way; for if the same applications were made to a sore, they would hardly increase the discharge of that sore, probably rather decrease it. However, in many cases, where the parts are indolent, and hardly admit of true inflammation, in consequence of which a perfect suppuration cannot take place; by stimulating the skin, a more salutary inflammation may be produced, and of course a quicker suppuration; but in the true suppuration, where inflammation preceded it, I believe it is hardly necessary to do any thing with respect to suppuration itself. And yet, from experience, I believe these applications have been found to bring the matter faster to the skin, even in the most rapid suppurations, which was supposed to be an increased formation of matter; but it can only be in those cases where the inner surface of the abscess is within the influence of the skin. This effect arises from another cause or mode of action being produced, than that of quickening suppuration, which is the hastening on of ulceration. I have mentioned, that ulceration was an effect of, or at least attended by, inflammation; and, therefore, whatever increases that inflammation, will also increase the ulceration, which will bring the matter sooner to the skin, without an increased formation of matter.

"Poultices of bread and milk are commonly used to inflamed parts when suppuration is known to have taken place; this application can have no effect upon suppuration, excepting by lessening inflammation, or rather making the skin easy under it; for we observed, that true suppuration did not

begin till inflammation was abated; but the inflammation must have reached the skin before poultices can have much effect, for it can only affect that part.

"It may be thought necessary that the ease of the patient should be considered, and we find that fomentations and poultices often produce that effect; we find too, that by keeping the cuticle moist and warm, the sensitive operations of the nerves of the parts are soothed, or lulled to rest; while, on the contrary, if the inflamed skin is allowed to dry, the inflammation is increased; and as probably suppuration is not checked by such treatment, it ought to be put into practice. As warmth excites action, it is probable, the warmer the fomentation, so much the better; and in many cases the action is increased so that the patient can hardly bear it."

What follows on *the treatment of abscesses* is important and purely practical. Mr. Hunter's intention is to lay down such general surgical rules for their treatment, and for many of their consequences, as will include almost every disease of this kind, considered as an abscess simply. He speaks with great indecision concerning the advantage and disadvantage of large and small openings. Whether this arises from his opinion concerning the admission of air, or from his considering the lumbar abscess as a collection of matter, not arising from inflammation, but of scrofulous origin, and so not to his present purpose, is not very evident; but it is highly material that the surgeon should consider this point well before he proceeds to make a large incision in such cases. We reserve for our article on the lumbar abscess what the author offers on this head, and proceed to notice his excellent remarks.

On *collections of matter without inflammation*, "I have hitherto," says he, "been describing true suppuration, which I have said, I believe is a consequence only of inflammation, a process genenerally allowed. Also in treating on the cause of suppuration, viz. inflammation, I hinted, that there were often swellings, or thickening of parts, without the visible or common symptoms of inflammation, viz. without pain, change of colour, &c.; and I also hinted, in treating of suppuration, that there were collections of matter somewhat similar to suppuration, which did not arise in consequence of the common inflammation: these I shall now consider. I conceive all such collections of matter to be of a scrofulous nature; they are most common in the young subject, and seldom found in the full-grown or old. It is commonly called matter, or pus, and therefore I choose to contrast true suppuration with it. Although I have termed this suppuration, yet it has none of its true characters, any more than the swellings, which are the forerunners of it, have the characters of inflammation; and as I did not call them inflammatory, strictly speaking, I should not call this suppuration; but I have no other term expressive of it.

"Many indolent tumors, slow swellings in joints, swellings of the lymphatic glands, tubercles in the lungs, and swellings in many parts of the body, are diseased thickenings, without visible inflammation; and the contents of some kinds of incysted tumor; the matter of many scrofulous suppurations, as in the lymphatic glands; the suppuration of many joints, viz. those scrofulous suppurations in the joints of the foot and hand; in the knee, called white swellings; the joint of the thigh, commonly called hip cases; the loins, called lumbar abscesses; the discharge of the abovementioned tubercles in the lungs, as well as in many other parts of the body, are all matter formed without any previous visible inflammation, and are therefore, in this one respect, all very similar to one another. They come on insensibly; the first symptom being commonly tumefactions, in consequence of the thickening, which is not the case with inflammation, for there the sensation is the first symptom.

"These formations of matter, although they plainly approach the skin, yet do not do it in the same manner as collections of pus. They do not produce readily either the elongating or the ulcerative process, and, as the matter was not preceded by the adhesive inflammation, these collections are more easily moved from their original seat in some other part, by any slight pressure, such as the weight of their own matter, which I have called abscesses *in* a part, in opposition to abscesses *of* a part. When the matter does approach the skin, it is commonly by merely a distension of the part, coming by a broad surface, not attended with any marks of pointing."

Having noticed the softness of the surrounding parts of these tumors, and their not being attended with much thickening; the author acquaints us, that "Such collections of matter are always larger than they would have been, if they had been either a consequence of inflammation, or attended by it; this is owing to their indolence, allowing of great distension beyond the extent of the first disease, even moving into other parts; whereas, an abscess in consequence of inflammation, is confined to the extent of inflammation that takes place on suppuration, and its rapid progress towards the skin prevents distension, and of course extension of the disease.

"All those formations of matter, not preceded by inflammation, nor a consequence of it, are, I believe, similar to each other, having in this respect one common principle, *very different from inflammation*. The cancer, although it produces a secretion, yet does not produce *pus* till exposed; it is, therefore, one of those diseases, like the scro-

fula, which does not suppurate till inflammation comes on, and even seldom then; for true suppuration arises from inflammation, terminating in a disposition to heal, which is not the case with cancer. In the scrofulous suppuration there is often a like reluctance to heal.

"The *kind of matter* is another distinguishing mark, between that produced in consequence of inflammation, and what is formed without it; the last being generally composed of a curdly substance, mixed with a flaky matter: the curdly substance is, we may suppose, the coagulating lymph deprived of its serum, and the other, or flaky, is probably the same, only in smaller parts; it looks like the precipitate of animal matter, by an acid or alkali.

"So far these productions of matter, in their remote and immediate cause, are not in the least similar to that arising from common inflammation, nor is the effect, viz. the matter, similar; and to show still further, that suppuration is always preceded by inflammation, the very surfaces which formed the above matter, immediately produce true matter, when the inflammation comes on, which it always does whenever opened."

As they are not similar in their causes, or in their modes of production, Mr. Hunter thinks it necessary next to examine "how far they are similar in their first steps towards a cure."

"All parts," says he, "which form matter of any kind, viz. whether in consequence of inflammation or otherwise, must go through similar processes to produce the ultimate effect or cure. The first step, in either, is the evacuation of this matter; for till this is effected, nature cannot pursue the proper means towards a cure; and if opened, the second step is granulation, and the third cicatrization. To accomplish the evacuation of the matter, there are two modes; one is the absorption of the matter, which is very common in the scrofula, or those productions of matter, not preceded by inflammation. This produces no alteration in the part, except that it gradually creeps into a sound state, the parts uniting again that had been separated by the accumulation of the matter; it produces also no alteration in the constitution. Absorption, however, seldom takes place in suppuration, which is the consequence of inflammation. The other mode of discharging this matter is either by opening the abscess, in order to allow it to pass out, or by allowing ulceration to take place from the inside to produce its escape; and this process, in the present case, having peculiarities different from those arising from inflammation, it is necessary they should be understood. Ulceration, in consequence of suppuration arising from inflammation, is very rapid, especially if the suppuration is so likewise; but ulceration, in consequence of matter being formed, which is not the effect of inflammation, is extremely slow; it will remain months, even years, before the parts have completely given way; they commonly come to the skin by a broad surface, and not pointing like a circumscribed abscess in consequence of inflammation; so far these two differ."

We have hitherto considered abscesses, their symptoms, and treatment, without any regard to the circumstances that may arise in consequence of their situation, or the peculiarity of structure of the parts in which they are situated. In some instances, the abscesses which happen in particular parts severally constitute diseases of particular names; and to those heads, of course, the reader is referred. But where this is not the case, it may be proper to enumerate them, and shortly to point out their difference from the common instances of imposthumation.

1. *Abscess surrounding the anus.*—The rectum is surrounded by loose cellular membrane and fat, which fills up the cavity on all sides of the anus, and this is the seat of the disorder. The causes are various; as *piles*, *contusion*, *inflammation*, *difficult labour* (*in women*), *hard riding*, *dysentery*, *the venereal disease*, &c. *Abscesses* sometimes are suddenly formed in this part; at others they advance very slowly. *In the first case*, the appearances are, in the beginning, no other than those of a common boil; but the symptoms soon increase, and become formidable. *In the latter*, though the suppuration makes but little progress, the pain and tumor suffice to determine the nature of the complaint. The pus, whether it makes its way through the external skin, or internally through the intestine, is frequently so tedious in its passage, that the adjacent fat is more or less corroded, whence sinuses are formed of different shapes and sizes, rendering the cure both difficult and uncertain. When *abscesses* in this part are left to themselves, they rarely fail to degenerate into fistulas, and occasion troublesome callosities.

As soon as the tumor is formed, we should endeavour with all possible speed to suppurate it. This is best done by fomentations, followed by the use of camphorated ointment, and lastly a soft poultice of bread and linseed meal. When the abscess is in some degree advanced, we must procure a discharge of the matter; and, to this end, the patient should be made to stand on the ground with his feet asunder, and leaning over a table upon his belly; then the operator, introducing a finger into the anus, will perceive the matter in a fluctuating state; in which case, without waiting for the external signs of suppuration, he should make an opening into it with a knife. By pressing the finger in the anus on the *abscess*, and another on the external part, a judgment may be formed where to make the puncture; for, by the finger in the rectum, the pus may be pressed externally, so as to be perceived by the finger there. When a

sufficient opening is made, the dressings, &c. are as in *abscesses* in general, taking care to preserve a free passage for the discharge till the cavity of the abscess is consolidated, otherwise a fresh accumulation of pus may take place, and the case may at last terminate in a fistula. Where this ultimately happens, the means are to be pursued which are related under FISTULA. Where the cause is venereal, these tumors suppurate slowly; and, without a gentle mercurial ptyalism, a cure is hardly to be effected.

2. *Abscess in the Ear.*—The symptoms attending an *abscess* in this part have nothing peculiar, except that the pain is very exquisite. See OTALGIA.

3. *Abscess in the Arm-pit.*—*Abscesses* are often formed by injuries in the arm, hand, or fingers, especially from dissection, in which case the absorbent vessels of the arm are inflamed. Sometimes a fever, at its crisis, lodges matter there; and, when it is of a malignant kind, these tumors suppurate but slowly. When ripe, an opening should be made with caustic. This glandular abscess, when it terminates the plague, or arises from venereal infection, is usually called a BUBO, which see.

4. *Lumbar abscess*, or that which takes place *in the Back and Loins.* For a particular account of this, see the article PSOAS.

5. *Abscess of the Gums*, also called *Parulis*, or *Gum-Boil.* Dr. Cullen places this as a variety of phlogósis phlégmone. These tumors are very painful, the inflammation is often more diffused than in other parts, and more or less attended with a swelling in the cheek, or perhaps the whole face. The *general causes of inflammation*, a *carious tooth*, &c. are the causes of this complaint. Mr. John Hunter observes, that gum-boils seldom arise from any other cause than inflammation in the cavity of a tooth, the effect of which extends all over the face, but more particularly in the gums; that sometimes this complaint originates from a disease in the socket of the tooth, or in the jaw, without any connection with the tooth. Through bad management, or neglect, they are apt to degenerate into fistulous ulcers. During the inflammation, to assuage the pain, let the patient hold a decoction of barley, or any warm fluid, constantly in his mouth, spitting it out, and taking fresh quantities, as may be needful. If the suppuration cannot be avoided, let figs be split and held in the mouth upon the boil, and warm poultices repeatedly applied upon the cheek of the affected side; and as speedily as is convenient let the *abscess* be opened, for the contained matter soon corrodes the adjacent parts, and affects the bone. The discharge being made, the mouth may be gargled with warm port wine and honey of roses. If a bad tooth is the cause, it must be extracted before any attempts are made by medicines or, at least, as soon as the discharge of the *abscess* will permit. If the ulcer degenerates into a fistula, inject tincture of myrrh and honey of roses into it; and, if this does not succeed in a short time, lay the part open by an incision. When the bone is carious, proceed as for the exfoliation of a carious bone. See CARIES.

6. *Abscess of the lachrymal Gland.*—Whatever may be the cause of this *abscess*, it usually ends in a fistula lachrymalis. To prevent this, an early opening must be made into the part, for the discharge of the matter.

7. *Abscess of the Liver.*—A suppuration often occurs if an inflammation continues in the liver more than three days. The pain remits, and is followed by a pulsation in the same place, shiverings come on, with a continuance of an icterical or yellowish colour of the skin; soon after which a tumor is perceived in the region of the liver, and a sense of weight also. A hectic fever follows, with thirst, and an extreme feebleness. The pain generally extends to the throat, and to the extremity of the shoulder, and a dry, but not very frequent cough, incommodes the patient.

The terminations of an *abscess* in this viscus are:

1st, The liver is corroded and consumed; in which case, after a tedious icterical wasting, a slow fever, great anxiety, a sanious and fœtid diarrhœa, &c. the patient dies.

2dly, The *abscess* breaks inwardly, and discharges a sanious pus into the belly. Thus the rest of the viscera are irritated, a consumption of the whole body succeeds, and an ascites, &c. closes the scene.

3dly, The matter of the abscess passes by the biliary ducts into the intestines, and, regurgitating into the stomach, causes various coloured and offensive vomitings; or, passing downwards, produces a violent diarrhœa. Acid and acescent substances may palliate for a time, but the end is always fatal.

4thly, The tumor may adhere to the peritonæum, and form an external *abscess*, evident both to the sight and touch. *Here alone is any hope to obtain a cure;* a caustic may be applied, and left to suppurate: for it is observed by Aretæus, that an incision is not safe, because it endangers a hæmorrhage, which in the liver cannot be restrained. Instances, however, have occurred in which this abscess has been successfully opened by incision, though there is no reason why it should be preferred to the caustic.

8. *Inguinal abscess.*—These are sometimes occasioned by injuries done to the parts below, as in the knees, legs, or toes; a pestilential fever may be the cause, but the venereal disease is the most frequent. See BUBO. If opened with a knife, the surgeon should be careful not to wound the inguinal artery. In venereal cases, or indeed in any other, a caustic is the best for opening them, as it dissolves part of the induration which too often

remains after the greatest part is suppurated, and also assists in digesting the remainder. If *abscesses* in the groin, or in the arm-pit, result from the crisis of a fever, it is proper to open them with caustic, and keep them running till all danger from the fever is over. In glandular parts all that is hardened should be perfectly dissolved; for instances have occurred of serious mischief proceeding from the remaining indurations.

9. *Abscess in the Intestines.*—Before an *abscess* is formed in these parts, there is always a throbbing pain felt near the part affected. At the beginning of the suppuration there are unequal shiverings, which increase and remit; also a fever, with an exacerbation of the symptoms in the evening. When this succeeds an inflammation of the bowels, it begins in about four days after the attack of the inflammation, at which time a shivering comes on, which extends through the whole body, and an obtuse pain, with a sense of weight, is perceived in the part affected. After the pus is quite formed, the symptoms abate, and the pain nearly ceases, till the time of breaking approaches, and then the pain is renewed, and sometimes the belly is violently constipated. After the discharge, a quantity of aqueous pus is thrown out by stool. In about fourteen days the pus makes its way into the cavity of the belly, and produces inconveniences similar to those arising from a discharge of the like kind from the liver; or, passing into the intestines, it runs off by stool. In this case, entire membranes are discharged, and a consumption often follows.

If, on the first attack, the means employed against an inflammation of the intestines fail, little more is to be done than to supply the patient with emollient and mildly detergent broths, until, by the continuance of the excretions, the dysenteric state is arrived, when the treatment is similar to that in a dysentery.

10. *Abscess in the Hip,*—a species of *Arthropuosis.* When an *abscess* forms in the socket, or the head of the thigh-bone, there is usually a great swelling and lameness in the hip, and in time a collection of matter takes place there also. However, this is not the only way it proceeds, for instances have occurred in which it has passed through the bottom of the acetabulum into the belly; and in these cases, when the patient went to stool, the matter, by straining, was forced back, and through the external wound. Mr. Pott observes, that this disease originates in the hip-joint; yet, in this case, the leg of the affected joint is shorter than the other, the pain begins where the disease originates, i. e. about the great trochanter. "It is (he says) a disease of the joint and ligaments that surround it." He farther adds, that if these or any similar scrophulous affections admit, in their beginning, of a remedy, he believes it only to be done by issues; "therefore (says he) in scrophulous hips, apply a large caustic on the part, large enough to admit of five or six peas, and keep up the discharge thereby as long as it appears to be necessary." Unfortunately, though this method, if early used, is much to be depended on, like many other valuable means, it is usually applied too late.

11. *Maxillary abscesses.—Abscesses about the Jaws* often proceed from the common causes, such as a carious tooth, the tooth-ach, an injury done to the socket of the jaw in extracting a tooth, &c. *Abscesses* under the chin are frequent in children, but they easily give way to the common methods. The glands under the jaws are very subject to suppuration, and are often mistaken for strumous swellings, but they differ greatly from them. Tumors occur in which the fluid is contained in a cyst, which last requires to be destroyed by escharotics after the matter is discharged.

12. *Abscess of the Mediastinum.*—In such a case, there is little to be done for the relief of the patient; yet it is observed by Dr. Kirkland and several other practitioners, that, in the venereal disease, this disorder is peculiar and frequent.

13. *Abscess of the Mesentery.*—Suppurations in this part are not suspected by many, because neither heat nor pain are always perceived in it; but these symptoms, though commonly attendant on, yet are not essential to, inflammation, and suppuration: it is on the sensibility of the parts that these depend. It may be observed too, that pus is in no place more readily formed, than in parts that are every-where covered with fat. In fact, *abscesses* in the mesentery are far from being rare, and are generally to be discovered by a continual hectic fever, an oppressive uneasiness in the belly, a discharge of sanious matter by stool, and sometimes pain and heat in the intestines. The sanious matter is also not unfrequently absorbed; and, being mixed with the blood, is conveyed to other emunctories, as the glands of the trachea, the kidnies, &c. Hence large imposthumes of the mesentery are often accompanied with discharges of purulent urine, or a spitting of purulent matter, though at the same time no injury has happened either to the lungs or to the kidnies. If the *abscess* is seated in a place less fit for the excretion of its contents, very troublesome pains, resembling a cholic, are produced. If the matter is discharged into the cavity of the abdomen, it produces a gangrene in the parts it touches. Horstius, Bartholine, and Tulpius, give instances of the pus being emptied into the cavity of the intestines, and so discharged by stool, but, notwithstanding all these circumstances, for the most part the diagnostics are very obscure; nay, these *abscesses* have remained unsuspected, till dissection after death has discovered them. If this complaint is manifest, and the tumor can be perceived, emollients may be applied externally,

and internally may be administered aperient and gentle purgative medicines, and such remedies as are used in obstructions of the liver and spleen, &c. These suppurations are generally in the glands of the mesentery, and are to be ranked among the internal scrophulous affections. The mesenteric glands are often found, after death, in a scirrhous state; accompanied by a thickened state of the mesentery itself.

14. *Abscess in the Eye-ball.*—It is from the small-pox most frequently, though from other causes, that this accident sometimes happens. When the seat is in the transparent part of the cornea, it is discovered by the peculiar whiteness of its appearance. When it is in the opake part of the cornea, the eye is swelled, but more particularly so where the *abscess* is seated. If its seat is deeper, the first evidence of its existence is generally the extravasation of its contents in the aqueous humour. Those on the transparent cornea are generally cured by cautiously opening them with the point of a lancet, carefully avoiding the pellicles of this coat which lie beneath. In the other two kinds there is great danger of losing the sight, for they discharge themselves into the anterior chamber of the eye; though, sometimes, a cure is effected without any remaining inconvenience. When the matter of these diffuses itself so as to spread over all the pupil of the eye, then is formed the hypopyon; if only part of the pupil is covered by it, the matter forming itself into a speck like that at the bottom of the nail, it is called an *onyx*. In the cure of the chemosis, first use remedies to resolve the inflammation; if these fail, proceed as follows. If the contents of the *abscess* cannot be dipersed, but are found to extend to the pupil, place the patient fronting a good light, with his head reclined on the back of an easy chair; then make an incision into the transparent part of the cornea, beneath the pupil, taking care that the point of the lancet does not touch the iris, which lies behind the pus. Make the aperture wide enough to give a free vent to the matter, and afterwards apply a compress, wetted in rose-water. Some days after the first discharge, a fresh collection of pus may possibly present itself, in which case introduce a fine stillet into the incision, in order to allow of its passage outward, and proceed as at the first.

15. *Abscess in the Eye-lid.*—This, when external, requires no peculiar management different from *abscesses* in general, except that in opening it, when situated near the cilia, great care is required not to enter the lancet any deeper than is barely necessary to evacuate the *abscess;* for if the edge of the eye-lid is cut, an incurable watering of the eye is endangered. The direction of the incision is safest in the course of the orbicular muscle. An *abscess* situated on the inside of the eye-lid may be opened with a lancet, and then washed with a proper collyrium.

16. *Abscess of the Breast.*—This is an external disorder, which happens, for the most part, to women. Bruises sometimes are the cause; but, generally, a too active separation of the milk, or taking cold while the woman continues to suckle. This is treated of in the article Milk-Breast.

17. *Abscess in the Perinæum.*—An *abscess*, if suspected to be forming in this part, should, if possible, be prevented, because of its troublesome effects. It retards, or totally prevents the discharge of urine; and, by its proximity to the os pubis, those bones may be affected, and the case may even be attended with fatal consequences. If a suppuration is actually begun, proceed as with other *abscesses*, and discharge the matter speedily by an incision. A singular case of this kind is related in Le Dran's Observations; and Dr. Kirkland's Medical Surgery, contains some useful hints as to the treatment in such cases.

18. *Abscess of the Lungs.*—See Vomica.

19. *Abscess in the Kidney.*—When inflammation in the kidney suppurates, it is known by the following signs; viz. *a remission of the pain, which is succeeded by a pulsation, frequent rigors, a sense of weight and numbness in the part, with heat and tension; the urine is purulent and sometimes fœtid*, and, at others, *a whitish pus is discharged with it*, in which is nothing offensive. If this suppuration continue some time, the whole kidney, being consumed, forms a kind of bag; and in this case, a *tabes renalis* frequently succeeds; but if a small quantity of the inflammatory matter remain coagulated in the minute folliculæ of the urine, it forms a basis, to which the sabulous matter, which continually is passing by it, will adhere, and gradually form a stone, and which also, by the same means, will be augmented. When the *abscess* is burst, the urine becomes purulent; and though, in these cases, the discharge ceases, the kidney shrinks into a withered state.

20. *Abscess in the Antrum Highmorianum.*—This is known by a pain which is deep-seated in the cheek, and a tumor forms on its outer and upper part. There is a discharge of offensive matter from the nostril of the affected side, especially on inclining the head to the side that is sound; sometimes the breath is rendered very disagreeable by the caries produced in the teeth by this disorder. Mr. John Hunter observes, in his Natural History of the Human Teeth, part ii. that, "The pain in this disease is at first taken for the tooth-ach; however, in these cases, the nose is more affected than is observed in a tooth-ach. The eye is also affected; and it is very common for people with such a disease, to have a severe pain in the forehead, where the frontal sinuses are placed; but still these symptoms are not sufficient to distinguish the

disease. Time must disclose the true cause of the pain, for it will commonly continue longer than that which arises from a diseased tooth, and will become more and more severe; after which, a redness will be observed on the fore part of the cheek, somewhat higher than the roots of the teeth, and a hardness in the same place, which will be considerably circumscribed; this hardness may be felt rather highly situated on the inside of the lip." The cure is to be attempted by drawing one of the dentes molares from the affected side. Some draw the last tooth but one; and, if rotten, proceed to draw the next on each side of it. Then, through their sockets, a perforation is made into the antrum with a proper instrument; and the matter being discharged, the cure is finished by injecting a mixture of *aq. calcis*, *tinct. myrrh.* and *mel rosæ*, twice a day into the cavity, and retaining it with lint. In Mr. Gooch's Cases and Remarks, an extraordinary instance of this is related, with the ingenious and successful management employed. Mr. John Hunter proposes for the cure, 1st, if the disease be known to exist before the destruction of the fore part of the bone, to make an opening through the partition between the antrum and the nose; or, 2dly, by drawing a tooth, as above; but the latter method he prefers.

21. *Abcess of the temporal Muscle.*—The violent pain attending an inflammation and suppuration in this part arises from the tendinous sheath which covers it, by which the matter is so confined, that it can only escape downwards under the zygomatic process, and so points into the mouth on the outside of the dentes molares, where, when it has advanced, it may be assisted by a puncture to discharge itself. Mr. Hunter observes, that when the pain has been violent, and the fever excited by it considerable, he has, with advantage, made an incision along the muscles; and he advises, when an inflammation is considerable, that we should open the part without delay, for we never can perceive any fluctuation there, as the facia is so tight. Dr. Kirkland, in his Medical Surgery, speaks of this kind of abscess.

22. *Abscess in the Womb.*—When an inflammation here begins to suppurate, bladders of warm water should be applied over the part most aggrieved; and sitting frequently over the steams of warm water also should be advised, or the warm bath would be still more effectual. Oribasius observes, that these *abscesses* sometimes discharge themselves into the cavity of the uterus, at others into the intestinum rectum, or into the bladder. Forestus says, that if the discharge is into the cavity of the womb, and is whitish, the patient may recover; but the case is generally dangerous.

23. *Abscess in the urinary Bladder.*—Inflammation of the bladder is sometimes followed by an *abscess*. When this happens, it is known by an exacerbation of the symptoms, and a sense of weight in the parts about the perinæum and pubes. For this some advise to inject mucilaginous fluids, warm milk, &c. into the bladder, very frequently; but external fomentations or the warm bath are preferable, to hasten the suppuration. The case, however, is highly dangerous, and the treatment seldom successful.

ABSINTHIUM, (αψινθιον, from α, neg. and ψινθος, pleasant); *wormwood*, a plant of which there are several species, so named from their disagreeable taste. Authors vary much in their account of the etymology of this word; but the English name is originally an Anglo-Saxon one. "It is one amongst the most famous of the bitter plants (says Dr. Cullen), and has been used with much commendation for every purpose of bitters: the leaves of the *absinthium vulgare* are the best." Botanists enumerate no less than thirty-two different species. Those at present in use are the following:

ABSINTHIUM MARITIMUM, sea wormwood; the *Artemisia maritima* Linn. *Artemisia foliis multipartitis tomentosis, racemis cernuis, flosculis femineis ternis.* Class, *Syngenesia.* Order, *Polygamia superflua.* It grows plentifully about the sea-shore, and in salt marshes. Its taste and smell are considerably less unpleasant than those of common wormwood; whence it is preferred to that plant when too offensive to the stomach. A conserve of the tops, *conserva absinthii maritimi*, is directed in the London Pharmacopœia.

ABSINTHIUM VULGARE, common wormwood; called also *Absinthium ponticum; Absinthium romanum.* It is the *Artemisia absinthium*, Linn. *Artemisia foliis compositis multifidis, floribus subglobosis pendulis; receptaculo villoso.* Class, *Syngenesia.* Order, *Polygamia superflua.* This plant is a native of Britain, having a strong, disagreeable smell, and so intensely bitter a taste, as to be proverbial. It is a good tonic and stomachic, and is given by many as an anthelmintic. Externally it is used as an antiseptic, in fomentations. A tincture of the flowers is given in the *Edin. Pharm.* but the most agreeable way of administering this remedy is in pills made of the extract.

Tinctura absinthii.—Take of the flowering tops of wormwood, dried, four ounces; rectified spirits of wine ℔ ij.; macerate for two days, then press out the spirit, and pour it upon two ounces of wormwood; macerate for four days, then filter it through paper. Dr. Cullen thinks this a light and agreeable bitter. The dose is ʒ ij. ad. ℥ j.

Extractum absinthii.—Boil the dried leaves of wormwood in water, supplying fresh water as required, until the herb has given out all its virtues. Strain the liquor through flannel, and evaporate it with a gentle heat to the consistence of a soft extract.

This possesses all the bitter quality of the herb, without its ill flavour. In evaporating, all the oil, in which the offensive properties reside, is dissipated.

Both the foregoing preparations are considered useful in a great variety of diseases; in intermittent fevers, hypochondriasis, affections of the liver, gout, calculi, dropsy, worms, &c. probably from their tonic power. There is a question, Whether it is imbued with any *narcotic* power? Dr. Cullen is ready to admit the general assumption of such a power, from several considerations; particularly from the History of the Portland Powder, which shews, that there is, in every bitter, when largely employed, a power of destroying the sensibility and irritability of the nervous system.

ABSORBENTS. These are vessels which take up any fluid from the surface of the body, or of any cavity in it, and carry it into the blood. They are denominated, according to the liquids which they convey, *Lacteals* or *Lymphatics;* the former conveying chyle, a milky liquid, from the intestines; the latter lymph, a thin pellucid liquor, from the places from whence they take their origin. The latter also take up any fluids that are extravasated, and also substances rubbed on the skin, as mercury, and convey them into the circulation. Some have considered small venal ramifications as part of the absorbent system, which, however, is confined to the lacteals, lymphatics, and lymphatic glands. See LACTEALS and LYMPHATICS. The following kinds of absorption take place in animal bodies: first, the nutritious matter is absorbed, from the intestines, by the lacteals, which are the same *absorbents* as are found every-where else, though a distinct office is assigned them; secondly, by bibulous orifices over the external parts; thirdly, by the same kind on the internal surfaces of all cavities. There are absorbents also in bones.

As to absorption through the human skin, let it be considered that the use of baths demonstrate how great a quantity of fluid may be received into the body in this way. After rubbing the hand well, it has, in a quarter of an hour, imbibed an ounce and a half of warm water: at the same rate then the whole body would have received six or seven pounds. By Dr. Hunter, this matter was demonstrated beyond a doubt, by the following experiment, made on a living dog: An opening was made into the cavity of his belly, and three quarts of warm water were injected and secured. In about six hours after he was examined, and not above four ounces of the water were found remaining there. This power of absorption, however, has been observed, by Dr. Monro, senior, to lessen with our strength.

ABSORBENTS, (*Absorbentia*, from *absorbeo*, to suck up). Medicines which have no acrimony in themselves, and destroy acidity in the stomach and bowels; such are calcined magnesia, egg or oyster-shells, prepared chalk, &c.

ABSORPTION, (*Absorptio*, from *absorbeo*, to draw or suck up); an animal function, arranged by physiologists under the head of natural actions. It signifies the taking up of substances applied to the mouths of absorbing vessels. Thus the nutritious part of the food is absorbed from the intestinal canal by the lacteals; mercury is taken into the system by the lymphatics of the skin, &c. The principle by which this function takes place is a power inherent in the mouths of the absorbents, a *vis insita*, dependent on the degree of irritability of their internal membrane by which they propel their contents forwards to the receptaculum chyli and thoracic duct.

ABSTERGENTS, (*Abstergentia*, from *abstergo*, to cleanse away), are liquid or other applications that clear away foulness. The term is seldom employed by modern, though frequently used by the ancient writers.

ABSUS, the Egyptian lotus, a species of *Cassia*, described in *Ray's Hist.* In Linnæus's system of vegetables, it is the Egyptian four-leaved cassia.

ACACIA GERMANICA, *Succus pruni sylvestris;* the inspissated juice of the sloe, which is the fruit of the *Prunus spinosa* of Linnæus, now fallen into disuse.

ACACIA; the *Mimosa nilotica* Linn. The inspissated juice of the unripe fruit of this tree is brought to us from Egypt, in roundish masses, wrapped up in thin bladders. It is outwardly of a deep brown colour, inclining to black; inwardly of a reddish or yellowish brown; of a firm consistence, but not very dry. It soon softens in the mouth, and discovers a rough, not disagreeable taste, which is followed by a sweetish relish. This inspissated juice entirely dissolves in watery liquors; but is scarce sensibly acted on by rectified spirit.

Acacia is a *mild astringent medicine.* The Egyptians give it in *spitting of blood*, in the quantity of a drachm, dissolved in any convenient liquor; and repeat this dose occasionally: they likewise employ it in *collyria for strengthening the eyes*, and in *gargarisms for quinsys.* What is usually sold for the Egyptian acacia, is the inspissated juice of unripe sloes: this is harder, heavier, of a darker colour, and somewhat sharper taste, than the true sort.

ACANTHUS, (ακανθος from ακανθα, a thorn); so named from its rough and prickly surface). The leaves and root of the *Acanthus mollis*, *foliis sinuatis inermibus* Linn. abound with a mucilage, which is readily extracted by boiling or infusion; but the roots are the most mucilaginous. This plant has been employed for the same purposes as althæa and other vegetables possessing similar qualities. It is, however, fallen into disuse.

ACCELERATORES URINÆ, *accelerators of*

the urine, (from *accelero*, *to hasten)*; muscles, whose office is to hasten the ejection of the urine.

The *acceleratores urinæ* arise fleshy from the sphincter ani, and superior part of the urethra, and tendinous from the ischium. They are inserted into the corpus cavernosum, from near their beginning to a little below their union.

Dr. Hunter observes, that the *acceleratores urinæ* are fixed to, and surround the bulbous part of the urethra, meeting in a middle line or tendon at its external posterior part. They are blended, at the end of the bulbous part of the urethra, with the other muscles of the part. When these muscles are put into action, they contract upon the urethra, thereby making it narrower and expelling the last drops of urine. The semen also meets with a fresh propulsion from these muscles contracting upon it, when it is in the bulbous part of the urethra, which it is, and no farther, in the first conatus; and, by being in this large cavity, would get no farther, was it not for their action; so that they are truly *accelerators* of the semen as well as of the urine; and this seems the chief reason of the bulbous part of the urethra, or its being larger in one part than another, that the semen and urine might meet with a reservoir in their passage, which had a fresh contracting force or power, to forward their expulsion.

ACCESSION, *(Accessio*, from *accedo*, *to approach)*; the approach or commencement of a disease. This term is mostly applied to fevers which have paroxysms or exacerbations. Thus the accession of fever, means the commencement or approach of the pyrexial period.

ACCESSORII, (from *accido*, *to proceed from*, or *approach)*. So the eighth pair of nerves is named. Some anatomists have given the same appellation to some branches from the eighth pair. They arise by several filaments from both sides of the *medulla spinalis of the neck*. Having advanced to the first vertebra, each is fixed to the back side of the *ganglion of the nervus suboccipitalis*, or tenth pair; then again run upwards into the *cranium* by the great occipital hole, communicate with the ninth and tenth, return out of the *cranium*, and in their passage join the eighth pair; afterwards turning backward, and perforating the *musculus sterno-mastoideus*, terminated in the *trapezius*, having first sent some branches to the rhomboides.

ACEPHALUS, (ακεφαλος, from α, priv. κηφαλη, a head); a term applied to monsters born without heads. See MONSTER.

ACERB, (from *acer*, *sharp)*; a species of taste which consists in a degree of acidity with an addition of roughness; properties common to many immature fruits, such as the crab, the sloe, &c.

ACEROSUS, (of *acus*, from αχυρον, *chaff)*; a term used to signify that sort of brown bread which is made from wheaten flour without first separating the bran. In Botany, it is applied to a leaf, which is surrounded at the base by branny scales.

ACETATED, a term adopted by the London College in the new names given to certain chemical combinations of substances with the acetous acid. Thus, we have the *Acetated vegetable alkali*. (See KALI ACETATUM); and the *Acetated volatile alkali*. (See AQUA AMMONIÆ ACETATÆ).

ACETATES. The salts so called in the new chemical nomenclature, are formed by the union of acetic acid, or radical vinegar, with different bases. None of these have yet been introduced into practice.

ACETIC ACID, *(Acidum Aceticum)*. The best mode of acquiring the acetic acid in its most concentrated state, is to distil the acetate of copper. It may also be acquired by congelation, by exposing vinegar to frost, and taking care to throw out the ice before it thaws. By the first method it will saturate nearly its own weight of a fixed alkaline salt. This acid is called *acidum acetosum* in the London Pharmacopœia, and, properly, *radical vinegar*. When the acid of vinegar is combined with alkalies, earths, or metals, the salts so formed must be dried, and then the acetous acid may be separated in a very concentrated state by the addition of two-thirds of their weight of sulphuric acid, and distilling them in a sand heat.

The *acetic acid* differs, from all others, in general, in its particular odour; from the native vegetable acids in subtilty and volatility, and in not being obtainable in the form of concrete salt; from the mineral, in its habitude to different bodies, and the nature of the compounds it forms with them. Thus, from whatever the acetic acid joins, it is dislodged by a mineral acid; and compounds formed of the acetous acid, and fixed alkalies, dissolve in alcohol; whilst those with mineral acid, and the same alkalies, will not.

The concentrated acid of vinegar obtained from crystals of verdegrise, is not so pure as that acquired by congelation, or drawn from a neutral salt, being apt to retain a portion of the copper; which is easily to be proved by its turning blue when saturated with aqua ammonia. Its use on this account has been objected to by many, and it has therefore not been much employed as an internal medicine. However, as its medical virtues are similar to vinegar, it has been joined with camphor, and the essential oils of aromatic substances, by Mr. Henry of Manchester, in which form it emits a very refreshing and agreeable odour, well calculated to prevent the ill effects of noxious effluvia in crouded assemblies, prisons, &c.

ACETITES, in the new medical nomenclature, are salts formed by the union of the acetous acid with different bases. Those at present used in practice are the *aqua ammoniæ acetatæ*; the *hydrargyrus acetatus*; the *kali acetatum*; and the *cerussa acetata* and *aqua lithargyri acetati*.

ACETOSA, (or ACETOSUS, *eager* or *sour*, from *acesco*, to be sour); in English called SORREL, from the Saxon word, which signifies sour. Of this plant, botanists reckon up about eighteen different species, of which only the following are occasionally used in medicine.

1. *Acetosa vulgaris*, called also *acetosa* pratensis, *acetosa* arvensis. It is the RUMEX ACETOSUS of Linn. Rumex pratensis, foliis oblongis sagittatis, floribus dioeciis Linn. CLASS, *Hexandria.* ORD. *Trigynia.* Gen. Plant. 451. COMMON SORREL.

It is the *oxylapathum*, called SOUR DOCK, whose leaves are sour, but not the root, which is bitter. It grows in the meadows and common fields.

2. *Acetosa Romana*, called also *acetosa rotundifolia hortensis.* It is the *rumex scutatis*, or *Helveticus*, *foliis cordato-hastatis*, *ramis divergentibus*, *floribus hermaphroditis* Linn. The ROMAN or GARDEN SORREL.

It is common in our gardens, and in many places is known by the culinary name of *green-sauce.*

3. *Acetosella*, (from *acetosa*, wood sorrel); the OXALIS ACETOSELLA; or *oxalis foliis ternatis*, *scapo unifloro*, *flore albo*, *capsulis pentagonis elasticis*, *radice squamoso articulata* Linn. CLASS, *Decandria.* ORD. *Pentagynia.* Gen. Plant. 581. WOOD SORREL.

It grows wild in the woods, and flowers in April. The leaves are shaped like a heart, standing three together on one stalk.

All the sorrels are injured by drying. They are all mildly acid, without any particular smell or flavour; the common is the least, the wood sorrel the most agreeable. If the leaves are bruised, they afford a large portion of a green juice, with very little pressure. If this juice is permitted to subside, a clear reddish fluid soon appears, which, if poured from the fæces, is a most agreeable preparation. It may be mixed with whey, and is then a most acceptable and useful drink in fevers of all kinds. A decoction of the whole plant is a very agreeable substitute for wine, when wine is coveted by a patient to whom we cannot prudently allow it. The leaves are as powerful suppurants, when employed in the form of a poultice, as the roots of white lilies. If the leaves of any of the sorrels are boiled in milk, an agreeable whey is soon separated, which is very palatable. Though chiefly used to quench thirst, and to allay heat, it is also esteemed antiscorbutic and diuretic.

A great part of the acid of sorrel may be obtained in the form of a concrete salt, which is more acid than that of tartar, more easily soluble in water, and less, if at all, purgative. Wood sorrel yields of salt near one-hundredth part of the weight of the fresh leaves, and it may be substituted, when necessary, for the salt or juice of lemons. A salt prepared from this plant, is known by the name of *Essential Salt of Lemons*, and commonly used for taking ink-stains out of linen. Heretofore, a conserve of wood sorrel, the *Conservus Lujulæ*, was kept in the shops. The fresh leaves were beaten into a conserve, with thrice their weight of sugar. Of all the conserves this is perhaps the most palatable, being agreeably acid, and possessed of a flavour somewhat resembling fine tea.

ACETOSELLA. See ACETOSA.

ACETOUS ACID, a preparation of vinegar, called *acetum distillatum* by the London college, and *acidum acetosum* in the new chemical nomenclature. It is chiefly employed in pharmacy in the class of salts termed *acetites.* See ACETITES. It is of great use in the practice of surgery as a discutient. See ACETUM.

ACETOUS FERMENTATION. See FERMENTATION.

ACETUM, vinegar, is an acid liquor produced by suffering substances that have undergone the change induced by the vinous, or first stage of fermentation, to be further altered by the next stage, called the acetous fermention, wherein the alcohol and tartar are reunited, and, if the vinegar be perfectly formed, their properties are entirely lost. During this fermentation, much pure air is absorbed, an innoxious acid smell is emitted, and a reddish mucilaginous sediment is deposited. This fermentation succeeds best in an heat between 75 and 90 degrees of Fahrenheit's thermometer. The contact of air is necessary, on which account the vessels employed should be loosely closed. It will also succeed, though more slowly, in the common heat of a cellar, with little attention. The weakest and worst wines, cyder, and in England, solutions of farinaceous matter, as wort or infusion of malt, are commonly employed. Milk also readily forms vinegar. Sugar and water, in the proportion of little more than one pound to a gallon, make tolerable vinegar; but the more perfect the wine, the better will be the vinegar. Vinegar, so procured, is separated from the mucilage and other substances mixed with it by distillation in earthen or glass vessels: in this state it is used in medicine under the title of *acetum distillatum*, or *distilled vinegar.* Common, or undistilled vinegar, is employed in several compositions in the new college Pharmacopœia; viz. in the *acetum scillæ*, formerly called *acetum scilliticum*, or *vinegar of squills;* in the *oxymel æruginis*, instead of the *mel ægyptiacum*, in the *oxymel scillæ*; and in the *oxymel simplex.* Distilled vinegar, or *acetum distillatum*, is employed in the *kali acetatum*, formerly called *sal diureticus*, in the *aqua ammoniæ acetatæ*, or *spiritus Mindereri;* in the *cerussa acetata*, formerly called sacchar. saturn. in the aqua lithargyri acetati, commonly called *extract. saturni*, and in the *oxymel colchici*, or *oxymel* of *Colchicum*, or the *autumnal saffron. Acidum acetosum*, called by M. Fourcroy, *acidum aceticum*, is ordered by the College to be distilled from verde-

grise; the *acidum acetosum* is directed in the *hydrargyrus acetatus*. The latter *(acidum acetosum)* is found by experiment to differ essentially from the *acetum distillatum*, on account of the oxygen, or base of vital air in the oxyd or calx of copper with which it is combined.

Vinegar is an article by no means unworthy of being classed amongst our chirurgical remedies. Independent of its convenience and efficacy when joined with farinaceous substances and applied as a cataplasm to sprained joints, as will be noticed in its proper place, it forms an eligible lotion for inflammations of the skin, when mixed with alcohol and water, in about equal proportions.

It has also been found of service in quickening the exfoliation of carious bone; an effect which, in all likelihood, is owing to its known property of dissolving the earthy part of bone.

Some account has been given of its excellent effects when immediately applied to burns and scalds. A persevering application of it in these cases, assuages the violent smarting, and is of service notwithstanding any excoriation or loss of substance. At a proper period, it is good practice to apply powdered chalk in a sufficient quantity to absorb the discharge, covering the part with a common poultice. Mr. Cleghorn's ideas were communicated to the late Mr. Hunter, and by him recorded in the second volume of Medical Facts and Observations, in the following terms: "Mr. Cleghorn (says he) recommends the immediate application of vinegar, which is to be continued for some hours, by any the most convenient means, until the pain abates. Should it return, the vinegar is to be repeated. If the burn is so severe as to have destoyed any part, when the pain has ceased, it is to be covered with a poultice, which remains six, or at most eight hours; when removed, the part is to be entirely covered with very finely powdered chalk, until every moist appearance upon the surface of the sore has disappeared, when it is again to be covered with the poultice. The same mode is then to be pursued every night and morning until the cure is complete."

Mixed with an infusion of sage, or with water, it forms an excellent gargle for an inflamed throat, also for an injection to moderate the fluor albus. An imprudent use of vinegar internally is not without considerable inconveniences. Large and frequent doses injure the stomach, coagulate the chyle, and produce not only a leanness, but an atrophy. When taken to excess, by females, to reduce a corpulent habit, tubercles in the lungs and a consumption have been the consequence.

ACETUM AROMATICUM, a preparation of the Edinburgh Pharmacopœia, thought to be an improvement of what has been named *thieves' vinegar*. See ACETIC ACID. Its virtues are antiseptic, and it is useful to smell to in crowded courts of justice, hospitals, &c. when the air is offensive.

ACETUM DISTILLATUM. See ACETUM, and ACETOUS ACID.

ACETUM SCILLÆ, vinegar of squills. See ACETUM and SCILLA. This preparation of squills is employed as an attenuant, expectorant, and diuretic.

ACHILLEA, a genus of vegetables in the Linnæan system. There are twenty-one species. Of this genus the species *Millefolium* and *Ptarmica* were once used in medicine. The former is the *common yarrow*, or *milfoil*; the latter is the *sneezewort*, or *bastard pellitory*. *Achillea* is the systematic name for the *Ageratum* of the Pharmacopœias. See AGERATUM.

ACHILLEA FOLIIS PINNATIS. See the article GENIPI VERUM.

ACHILLIS, TENDO; the strong tendon connecting the gastrocnemius and soleus muscles with the heel, in the human subject. It is thought to have been so called because, as fable reports, Thetis, the mother of Achilles, held him by that part when she dipped him in the river Styx, to make him invulnerable. Some writers, however, suppose it was thus named by the ancients, from their custom of calling every thing *Achillean*, that had any extraordinary strength or virtue in it; whilst others again say it is thus named from its action in conducing to swiftness of pace, the term importing so much. See GASTROCNEMIUS and SOLEUS.

ACHMELLA, *Spilanthus achmella* Linn. *Spilanthus foliis ovatis*, *serratis*, *caule erecto*, *floribus radiatis*. An infusion of the herb and seeds of this plant are employed in cases of calculus of the kidneys and urinary bladder.

ACIDS, an important class of chemical substances. It appears now to be well ascertained, that these bodies are combinations of oxygen or vital air with certain elementary substances. The analysis of almost all the acids, whose component parts are known, establishes this truth in a positive manner; and it is on account of this property that the denomination of *oxygenous gas* has been given to vital air. Every substance which possesses the following properties is called an *acid*.

1. A sour corrosive taste. The term *sour*, usually denoting the impression, a lively and sharp sensation produced on the tongue by certain bodies, may be regarded as synonymous to the word *acid*. The only difference which may be established between them is, that the one denotes a weak sensation, whereas the other comprehends all the degrees of force from the least perceptible taste to the greatest degree of causticity. The causticity of acids seems to arise from their strong tendency to combination; and it is from this property that Sir Isaac Newton has defined them to be bodies which attract and are attracted. It is likewise from this

property that some chemists have supposed acids to be pointed bodies; and, on account of the decided tendency to combination which they possess, it seldom happens that they are met with in a disengaged state.

2. The next property of acids is that of changing certain blue vegetable colours into red, such as the colour of turnsole, syrup of violets, &c. These two re-agents are commonly used to ascertain the presence of acids.

It is proper to observe that the tincture of turnsole is prepared by lightly infusing in water that substance which is known in common under the name of *Turnsole* or *Litmus*. If, however, the water be too highly charged with the colouring matter, the infusion has a violet tinge, and must in that case be diluted with distilled water until it becomes blue. This tincture, when exposed to the sun, becomes red, even in closed vessels; and some time afterwards the colouring part is disengaged, and falls down in the form of a mucilaginous discoloured substance. Alcohol may be employed instead of water in the preparation of the tincture of turnsole.

In trying any concentrated acid with syrup of violets, there are two circumstances to be attended to. The syrup of violets is often green, because the petal of the violet contains a yellow part at its base, which, when combined with the blue, forms this green colour; it is therefore essential to employ only the blue of the petal in order to have a beautiful blue infusion. Care must also be taken to dilute the syrup with a certain quantity of water; otherwise concentrated acids, such as the sulphuric, would burn it, and form a coal. The simple infusion of violets may be used instead of the syrup. The colouring matter of indigo is not, however, sensible to the impression of acids. The sulphuric acid dissolves it, without altering its colour.

3. A third character of acids is, that of their effervescing with alkalis; but this property is not general, as neither the carbonic acid, nor almost any weak acid, can be distinguished by this property. The purest alkalis also combine with acids, without motion or effervescence.

It has been a question much agitated among chemists, whether there be not, in nature, one particular acid, of which the others are only modifications. Paracelsus admitted an universal principle of acidity, which communicated taste and solubility to all its compounds; and Becher supposed, that this principle was composed of water and vitrifiable earth. After him Stahl endeavoured to prove that the sulphuric acid was the universal acid; and his opinion was adopted by most chemists for a considerable length of time. But long after the time of this excellent chymist, Meyer contended, that the acid element was contained in fire; and his system, which is founded on certain known facts, has had its supporters. The chevalier Landriani also imagined that he had succeeded in reducing all the acids to the carbonic acid; because, by treating them all with different substances, he obtained this last as the constant result of his analysis. He was led into an error for want of having sufficiently attended to the decomposition of the acids he made use of, and the combination of their oxigene with the carbone of the bodies which entered into his experiments, and produced the carbonic acid.

The strict analysis and synthesis of most of the known acids have, however, proved to Mr. Lavoisier, that oxigene is the base of all of them; and that their differences and varieties arise only from the substance with which this common principle is combined. Oxigene united with metals forms oxides; and among these last there are some which possess acid characters, and are classed among acid substances. The same substance, when combined with inflammable bodies, such as sulphur, carbone, and oils, forms other acids.

It has been found that the adhesion of oxigene to the base is more or less strong in the several acids, and consequently that their decomposition is more or less easy; as, for example, in metallic solutions, which do not take place excepting when the metal is in the state of an oxide. The acid which will yield its oxigene with the greatest facility to oxide the metal, will have the most powerful action upon it. Hence it happens, that the nitric and the nitro-muriatic acids are those which dissolve metals the most readily; and hence likewise it happens that the muriatic acid dissolves the oxides more easily than the metals, while the nitric acid acts in a manner directly contrary: hence also it arises that this last acts so powerfully upon oils, &c. It is, therefore, only from having a proper idea of the constituent principles of acids, that it is possible to conceive and explain the various phenomena which they present in their different operations.

With respect to the nomenclature of acids it is proper to remark, that the word *acid* being used as a generic term, each acid has lately been distinguished in language, as in nature, by the name of its base or radical. Thus the generic name of acids is given to the products of the combustion or oxigenation of sulphur and carbone; and these products are respectively named the *sulphuric* and the *carbonic acid*. There is, however, a remarkable circumstance in the oxigenation of combustible bodies, and of a part of such bodies as are convertible into acids; that they are susceptible of different degrees of saturation with oxigene, and that the resulting acids, though formed by the union of the same elements, are possessed of different properties, depending upon that difference of proportion. Of this the sulphuric furnishes us

with examples. When sulphur is combined with a small proportion of oxigene, it forms, in this first or lower degree of oxigenation, a volatile acid, having a penetrating odour, and possessed of very peculiar qualities. By a larger proportion of oxigene, it is changed into a fixed, heavy acid, without any odour, and which, by combination with other bodies, gives products quite different from those furnished by the former. These varieties in the oxigenation of the acids are expressed by simply varying the termination of their specific names. The volatile acid produced from sulphur was anciently known by the name of *sulphurous* acid, and this term is still employed to denote the same acid when under-saturated with oxigene; the other, the completely saturated or oxigenated acid, being distinguished by the name of *sulphuric* acid. In this new chemical language, we therefore say, that sulphur, in combining with oxigene, is susceptible of two degrees of saturation; that the first, or lesser degree, constitutes sulphurous acid, which is volatile and penetrating; while the second, or higher degree of saturation, produces sulphuric acid, which is fixed and inodorous. This difference of termination is also employed for all the acids which assume several degrees of saturation. Hence we have a nitrous and a nitric acid, an acetous and an acetic acid; and so on for others in similar circumstances.

Accounts of the different acids, in detail, will be found under their several names. See Carbonic Acid, Sulphuric Acid, &c.; but here it is proper to speak of the properties of acids as they are applied in medicine.

According to Dr. Cullen, their internal and external effects are thus particularised. Applied to the lips, he says, they show an astringent quality, as appears by vinegar expelling from them the red blood. This astringency is only proper to be taken notice of when they are considerably diluted. Hence the vegetable acid is commonly used, only where this part of their operation is required; and hence they are used to bathe over-stretched ligaments. In a more concentrated state, to this astringent they join a stimulant and rubefacient power, and therefore we have thought of applying them in paralytic cases; for which purpose we blend them with oily matters, as hogs lard, in the *Unguentum paralyticum*, to obviate an excess of their inflammatory property. A more fluid oil than the former may be employed, with the advantage, perhaps, of more accurate mixture. This ointment is certainly serviceable, though not possessing great advantages. If the acid be blended with too great a proportion of oil, the stimulus is not considerable; if not, it is inflammatory, and will even extend over the system. It ought only to be employed where benefit is expected from a few applications of it; for on repeated use, instead of increasing, you will easily see it must impair and destroy the sensation of the nerves. Applied alone in a concentrated state, acids prove corrosive, and destroy the texture of animal substances. This corrosiveness is not only taken off by an union with metals, but is increased by it. Thus, in the lunar caustic, somewhat of its effects may be attributed to the acid. The same is the case with the butter of antimony, to which, as well as to the acids, as caustics, may be objected the inconveniences of their fluidity.

With regard to the internal use of acids; on the mouth they exert *astringent* effects. To obtain this property, they have been exhibited in various forms. It was Sydenham's practice in the angina to give the vitriolic acid with *mel rosæ*. Where laxity prevails this may be useful, but it is difficult to distinguish such cases; and in more violent inflammation they are certainly hurtful and dangerous, by their stimulant, and perhaps also, their astringent power. Acids also exert their *stimulus* in the mouth, and increase the excretion of saliva and mucus, and hence allay thirst, in which intention they are sometimes given in dropsies, where we want that effect without increasing the quantity of fluids. It has been said, that they dissolve the mucus, but this is not properly proved. On experiment, they do not coagulate it like blood, but rather have a tendency that way: they rather concreted into crusts, as in the case of *aphthæ*. In any sort of cough, where much mucus is accumulated in the mouth, they may be used. Alum and acids have been employed to cure *aphthæ*, but the practice is doubtful. These will, indeed, take away the *aphthæ*, but then they are very apt to return worse than before, except in some particular cases, which are difficult to distinguish. Borax answers much better, especially in children.

To the stomach, acids prove a grateful stimulus, and they promote appetite, which shows they are not unfamiliar to the system. The acid *reliquiæ* in the stomach are supposed to be the cause of appetite, but this is more connected with the state of the system in general. Acids, by checking putrefaction, serve to preserve at least, if not to excite, appetite; but not only do they obviate the putrefactive, but also check the vinous and acetous fermentations; whence they are used to prevent flatulencies, &c. the consequences of these. Dr. Cullen at first thought this difficult to account for, but he afterwards observes, that it is not acid but *acescency* which is the disease; that vinegar which has already undergone the acetous fermentation, is not nearly so hurtful as vegetable acescents, and mineral acids still less so. Thus lemon, having its astringency improved by roasting, he says, cured spasms arising from acescency; and thus the chlorotic girl eats the sour green fruits with safety, while the ripe increase her

disorder. In the stomach, too, acids quench thirst, by promoting a flow of liquors to it, by preventing putrefaction, and perhaps, too, as being refrigerant. This property which acids possess, of being cooling and sedative to the whole system, seems contradictory to the stimulus we ascribed to them; but as acids in certain doses and dilution are astringent, and as astringents are sedative, the effect is more easily understood.

In the intestines, when acids arrive there unaltered, they may be detergent by promoting the coagulation of mucus. As checking putrefaction, as sedatives, checking the peristaltic motion, and also as astringents, acids are useful in dysentery; but chiefly as altering the bile, to a change of which, dysentery seems owing. It is the acescents in this disease which we prefer to the acids, perhaps from a sedative power analogous to neutrals. The fossile acids have not the same effect with the others, not proving much purgative. Their action in the intestines ought to be inquired into, as they precipitate the bile.

Whether in their progress through the lacteals they can act as acid, or in the mass of blood, is extremely doubtful, from the dilution they must necessarily undergo before they reach these systems. They might be supposed to cure, at least to check, the scurvy, but neither the one nor the other is observed, so that their effects on the mass of blood are very doubtful. They have been recommended in hæmorrhagy. Here it is supposed they act on the open vessels, and by coagulating the fluids; but we cannot imagine them to be carried thither, and we must rather suppose they have their effect in the *primæ viæ*, and not materially, but by consent on the vessels.

Though their effect on the blood be denied, yet it has been constantly allowed they may be collected in the excretories. Like other saline matters they may go along with the serosity, pass by the kidneys, and prove diuretic. On this foundation also they might be diaphoretic and sudorific, but from their manner of action these properties seem to be in consequence of their effects in the *primæ viæ*.

Acids are said to irritate the *bronchiæ*, and promote a cough, which suggests a caution as to their use in hæmoptoe, and such like cases where they are employed.

The fossile acids are the strongest when employed as medicines. *Muriatic* acid has at all times been famous as promoting appetite, and assisting digestion. Joined with alkali, Hoffman tells us it forms the *Tinctura aperitiva Mœbii*, which is only reddened by the addition of some roses. This acid given internally, Dr. Cullen observes, has the singular property of inflaming an issue.

Sulphuric acid is employed with the same view, and for most of the purposes of acids obviating fermentation, &c. This is supposed superior to the muriatic in hæmorrhagic cases, but why, it is not easy to perceive.

The *nitrous* acid, till lately, was excluded entirely, out of mere prejudice, for if equally dilute, it is as safe as any of them. Boerhaave employed it in his *nitrum nitratum*, which is a nitrous ammoniac, only with a superabundant quantity of acid. The trials of it in cases of syphilis, have, however, brought it much under notice. See SYPHILIS.

Acid of *amber* has been frequently used in medicine, though it is not so long since we discovered it to be an acid. Dr. Cullen says, it failed him in every trial. If any advantage be found from it, it is owing to the oil joined to the *sal succini*, for no body has yet used it pure, and indeed it is very difficult to procure it in that state.

ACID, AERIAL, another name for the carbonic acid or fixed air. See CARBONIC ACID.

ACIDITY (*aciditas* from *acesco*, *to sharpen*), the property of sourness. The seat of acidity in the human body, is principally the stomach and small intestines. Sir John Pringle has sufficiently proved, that the admixture of animal fluids cannot hinder the acetous process, but, on the contrary, that in certain proportions they promote it; and Dr. Cullen asserts, that none of the circumstances to which that has been usually ascribed, are sufficient to prevent the spontaneous tendency of the vegetable aliment to acidify. "I am certain," says he, "from experiments, that the vegetable aliment first turns acid in the stomach; for every stomach, human or brute, is always, on examination, found to have an acid present in it. Hence we see acescency is *not a disease*, *but a step towards assimilation*; and if physicians observe diseases proceeding from this cause, they ought to be attributed to the *state and degree of it*. As to the state or condition of it, it is this:—Whenever the aliment enters into a high vinous fermentation, with copious generation of fixed air *(carbonic acid gas)*, of the same nature with that produced in the ordinary vinous process, it becomes a *disease*, and has the power of destroying the *mobility* and *contractility* of the moving fibres, and even the tone of the stomach itself, producing there flatulency and spasm from irregular motions of the nervous power, and, at last, stupor, lethargy, apoplexy, and death. This happens chiefly from a fault of the animal organs; for though it appears, by Pringle's experiments, that animal fluids do not prevent fermentation, yet they have the power, in their sound state, of moderating the *generation of air*.

"When acidity is a disease, it always depends on the above, and on the *degree* or quantity of it; for although that acidity is necessary, yet it should only be of such a degree as afterwards to be over-

come by the admixture of the animal fluids. But though the *organs* are concerned in the cause of acidity, it also depends on the *quantity* of acid naturally in the vegetable, and its tendency to undergo the vinous fermentation. For the disease consists not so much in acidity as in the *vinous* fermentation. For if we take in vegetable matters, after they have undergone the vinous fermentation, their effects are not so much to produce flatulency, but rather depend on the quantity of acid taken in. Hence farinaceous substances, naturally acescent, when leavened, *impede*, though they do not *prevent*, the generation of flatulencies; and hence the same quantity of *vinegar* does not produce equally bad effects, as of vegetable unfermented juices.

" Acidity, as a disease, depends on the aliment:—1. As it contains a large proportion of saccharine matter. 2. When to that is joined a fresh acidity, which renders it more liable to ferment. Instances of this occur in the *fructus acido-dulces*. 3. When, by accident, it is put into a state of active vinous fermentation, and in its fermenting state is taken into the stomach, as new wines, ales, &c. These are the *qualities* that are apt to be most hurtful in their consequences. On the contrary, those substances which have undergone fermentation, are less liable to produce bad effects, and only do so from their quantity.

" When the aliment is pushed into the *intestines*, its acescency is more certainly overcome by the addition of the bile, and a supply of pancreatic and intestinal fluids, analogous to the *saliva* and gastric liquor; and as the aliment never *rests* in the intestines, it is always exposed to a mixture of new juices. The effects of bile on the aliment are as yet little known. Vegetable acids change the bile in colour, consistence, and taste, which last is sweet, and this mixture probably affords a new stimulus when the *acidity* prevails; and in this way our vegetable aliment *stimulates* the intestines, and produces purging." Thus we see, that an acid acrimony may derive its origin either from too great laxity and debility of the organs of digestion, or from an excess of acescent food. If any part of our aliment remain undigested, it will run into fermentation, and if vegetable, it will become sour. The food of children is for the most part of the vegetable kind, and readily turns sour in the stomach, if the system be any way disturbed; hence most of their disorders are accompanied with evident signs of acidity, as green stools, gripes, &c. Many assert a prevailing acid to be the cause of all diseases in children; but acidity in the stomach is oftener an effect than a cause of their complaints. It is not, in fact, acidity, but its excess, that is injurious."

A redundant acid in the primæ viæ is known by the *sourness of the eructations*, *frequent cardialgia*, *with curdling of the chyle*, &c. in the stomach, *flatulence*, and *spasms in the intestines*. When this cause is excessive in its degree, the bile is inert, the belly costive, and the nourishment is unduely supplied, a paleness becomes general in the skin, an itching comes on, pustules appear on the skin, and a train of mischievous symptoms soon succeed. Indeed, in all the diseases peculiar to children, there are the symptoms of an excess of irritation, the pulse sometimes beats one hundred, or one hundred and twenty strokes in a minute, the stomach is sick, the vessels of the skin are contracted, and convulsive symptoms appear.

Infants are frequently swept off by this disorder. Among adults, the weakly and sedentary are the only subjects of it, except among the poor, whose scanty supplies reduce them to this unhappy state.

The cure, when adults are the subjects, consists in a diet fitted to oppose this tendency. Animal food, and vegetables of the farinaceous kind, as potatoes, &c. occasional medicines of the tonic, aromatic, and alkaline kind; accompanied with moderate exercise at proper intervals. Absorbent earths may palliate the uneasy symptoms in the stomach and intestines, but the limaturæ ferri, or some other tonic, will most conduce to an effectual and lasting cure. Children should be exercised more, and fed less than is usual; irregularity in these begets flatus, acidity, gripes, &c. Antimonial emetics, repeated at intervals of two or three days, until the more disagreeable symptoms abate, are highly useful. Small doses of rhubarb and magnesia, so as to keep the belly soluble, are better than purging. To free from flatulency, we may add ol. anisi vel ol. ess. sem. fænic. dulc. a mixture of chalk, of magnesia, or other calcareous earths. The doses should be very frequently repeated until some relief is obtained, and then their distance may be increased. In some cases, small doses of fixed or volatile alkali, particularly *liquor vol. corn. cerv.* have been found highly beneficial, and warm stimulant plasters applied to the umbilical region.

ACIDULOUS WATERS; those mineral waters, which contain so great a quantity of carbonic acid gas, as to render them acidulous, or pungent to the taste. See Mineral Waters.

These waters have been very successfully imitated by Mr. Paul, by whom they are now prepared and sold in London. In a declaration made by him, to the Society for the encouragement of arts, &c. he appears to have employed a particular apparatus, capable of condensing, in water, quantities of carbonic acid gas, *superior* to those contained in the natural mineral waters, however carefully preserved. This also can be varied at pleasure, and the power employed is such as to impregnate rapidly a very considerable quantity of water. The same means, it also appears, is

equally applicable to the condensation of any other elastic fluid, with which water can be impregnated. The acidulous waters prepared by Mr. Paul are the following:

1. *Strong Seltzer Water.*—This is combined with five times its volume of carbonic acid gas, obtained in the usual way by effervescence from marble dust. The solid ingredients are in the same proportions, as those of the natural spring according to the analysis by Bergmann.

The natural Seltzer water has long been in estimation on account of its medicinal qualities, and as a wholesome and refreshing beverage. When drank on account of pulmonary complaints, it is very frequently taken with milk.

2. *Mild Seltzer Water.*—This differs only from the former in being combined with carbonic acid gas obtained by heat alone. The gas produced in this way is, by many, supposed to be less stimulating than that obtained by effervescence; and this mild Seltzer water is, on that account, preferred by persons of irritable and delicate habits. In taste it is somewhat less sharp than the former, approaching nearer to the natural Seltzer water.

3. *Soda Water.*—This is otherwise called *Alkaline Mephitic Water*, and is prepared of three degrees of strength, containing one, two or three drachms of pure crystals of Soda dissolved in each pint of water. It is combined with five times its volume of gas, which most effectually covers the taste of the salt.

This water possesses cooling and refreshing properties. Considered as a medicine, it has acquired occasional reputation in cases of calculus, gravel, and obstructions of the urinary passages; in dysuria, or strangury, from an irritable state of the bladder; and in certain kinds of indigestion, arising chiefly from an excess of acid in the stomach, producing heart-burn, flatulence, &c. The *double* Soda Water is the kind generally used.

4. *Potash Water.*—This is of the same nature as the last, and is also prepared of three degrees of strength, in the same proportions as the Soda water. It is somewhat less pleasant to the taste, and not more powerful as a medicine than the Soda water.

5. *Spa Water.*—This is a mineral water in the strict sense of the word. It is prepared of two degrees of strength. The weak contains the same proportion of iron as the *Pouhon spring* at *Spa*, viz. .56, (rather more than half) a grain of oxyd of iron in the pint. The strong Spa contains double that quantity.

6. *Pyrmont Water.*—This is of the same nature as the Spa. It contains nearly the same proportion of iron as the weak Spa, and is very highly charged with gas.

The Spa and Pyrmont waters are well known as tonic remedies.

7. *Seidlitz Water.*—This contains half an ounce of Seidlitz salt *(magnesia vitriolata)* in each pint of water, and is combined with five times its volume of carbonic acid gas, which very completely conceals the disagreeable bitter taste of the purging salt, and reconciles it to the most delicate stomachs. The Seidlitz water is reckoned a useful aperient, in bilious habits, &c. This water is occasionally prepared with different proportions of the salt, when so required.

8. *Aerated Rochelle Water.*—Of this, each pint contains one ounce of Rochelle salt, with five times its volume of carbonic acid gas.

9. *Chalybeate Aperient Water.*—In this the properties of *Seidlitz* and *Spa* water are united. It is intended as a substitute for Cheltenham water, in cases where it may not be possible to resort to that spring. Each pint contains three-quarters of an ounce of magnesia vitriolata, and one grain of oxyd of iron, and is combined with five atmospheres of gas.

It is well known that natural waters of this kind lose almost all their peculiar properties by keeping, owing to the escape of the small quantity of gas they contain, and the consequent precipitation of the iron. This artificial water is much stronger with regard to the quantity of both iron and purging salt than any of the natural springs.

10. *Hydro-sulphurated Water.*—In this, the water is combined with sulphurated hydrogen gas, and possesses the peculiar smell, taste, and other properties of the natural sulphurous waters. It is occasionally prepared with the saline ingredients of the Harrowgate water.

11. *Oxygenated* and *Hydro-carbonated Waters.*—In these, water is impregnated with as large proportions of those gases as can be united with them. They have not, as yet, been much attended to in this country, but have been found useful by some physicians of reputation abroad, in certain spasmodic affections of the stomach. See Pneumatic.

ACIDS, IMPERFECT, in the new chemical nomenclature, those which are not fully saturated with oxygen. The names of these are ended, in Latin, by *osum*, and in English by *ous:* as, *acidum nitrosum*, or *nitrous acid.*

ACIDS, PERFECT; in the new chemical nomenclature, such as are completely saturated with oxygen. Their names end in Latin by *icum*, and in English by *ic:* as, *acidum muriaticum*, or *muriatic acid.*

ACIDUM ACETICUM. See Acetic Acid.

ACIDUM ACETOSUM. See Acetous Acid.

ACIDUM BENZOICUM. See Benzoes.

ACIDUM CARBONICUM. See Carbonic Acid.

ACIDUM CITRICUM. See Citric Acid.

ACIDUM FORMICÆ. See Formic Acid.

ACIDUM MURIATICUM. Muriatic, or marine

acid, popularly named Spirit of salt. See MURIATIC ACID. This is much esteemed as an antiseptic; and given with bark, &c. to prevent putrid diseases. It, however, frequently proves purgative. A physician on the continent, who had great success in curing the typhous fever, lately published his method of cure, in consequence of a reward from the king of Prussia; and it is found to consist in giving very large doses of this acid.

ACIDUM NITRICUM. See NITRIC ACID. This acid has lately been extolled as an antisyphilitic. If we may be allowed to form a judgment from the relations of authors, it may at least be given with advantage in mixed cases of syphilis and rheumatism. As an antiseptic, however, it stands first in the catalogue: added to an infusion of rose-leaves, in the place of vitriolic acid, it proves a valuable medicine.

ACIDUM NITROSUM, the *Spiritus nitri fumans* of the shops. *Nitrous* acid possesses the same properties as the *nitric*, but in a much inferior degree. See NITROUS ACID.

ACIDUM SULPHURICUM, or ACIDUM VITRIOLICUM. See SULPHURIC ACID.

ACIDUM NITROSUM DILUTUM. This is the common *Aqua fortis*, or nitrous acid diluted, which possesses the same properties as the nitrous acid, but in an inferior degree.

ACIDUM SULPHURICUM AROMATICUM, the *Elixir vitrioli acidum* of the former London and Edinburgh Pharmacopœias, for which the London college has substituted the *acidum vitriolicum dilutum*. It is prepared thus:

Acidum Sulphuricum Aromaticum. Edin.

Take of Alcohol, two pounds;
Sulphuric acid, six ounces.
Drop in the acid cautiously, and digest the mixture, with a very gentle heat, in a close vessel, for three days.
Then add, Cinnamon, an ounce and a half;
Ginger, one ounce.
Digest again for six days, and then filter the tincture through a glass funnel.

In this preparation, the alcohol is partly changed, by the digestion with the acid, into an ethereal spirit.

It is a good medicine in weakness and relaxations of the stomach, and decays of constitution, particularly in those which proceed from irregularities, which are accompanied with slow febrile symptoms, or which follow the suppression of intermittents. It frequently succeeds, after bitters and aromatics by themselves have availed nothing; but, indeed, great part of its virtues depend on the sulphuric acid; which, barely diluted with water, has, in those cases where the stomach could bear the acidity, produced benefit. Joined with the tinctures of cinchona, and other tonic barks, it may be given in doses of ten to thirty drops, or more, several times a-day.

ACIDUM VITRIOLICUM, *vitriolic*, or *sulphuric acid*. This, in the Pharmaeopæias, is termed *acidum sulphuricum*, according to the new chemical nomenclature. It is exhibited in *synochus*, *cynache*, *scrophula*, &c. See SULPHURIC ACID.

ACIDUM VITRIOLICUM DILUTUM, *diluted vitriolic acid*. The virtues of this preparation are the same as those of the *acidum vitriolicum*, only in a degree proportioned to its inferior strength.

Acidum Vitriolicum Dilutum. Lond.

Take of Vitriolic acid, one ounce;
Distilled water, eight ounces.
Having gradually added the acid to the water, and set them aside to cool, pour off the clear liquor.

The most simple form in which sulphuric acid can be given internally, is that in which it is merely diluted with water: and it is highly proper that there should be some fixed standard in which the acid in this state should be kept. It is, however, much to be regretted, that the colleges have not adopted the same standard with respect to strength: for in the Edinburgh and Dublin colleges, the strong acid constitutes an eighth; and in the London, only a ninth, of the mixture. The former proportion seems preferable, as it gives exactly a drachm of acid to the ounce. Its dilution by means of distilled water is preferable to spring water; which, even in its purest state, is not free from impregnations affecting the acid.

Sulphuric acid and water, when combined, are less in bulk than the water and acid taken separately. At the same time, the considerable increase of temperature produced, is apt to crack glass vessels, unless the combination be very cautiously made. The Edinburgh preparation is called *acidum sulphuricum dilutum*.

ACINI BILIOSI, (from *acinus*, a *grape stone*; so called from their supposed resemblance); those small glandlike bodies of the liver which separate the bile from the blood were so called by the old writers: they are now, however, more properly named *penicilli*. See LIVER.

ACINIFORM TUNIC, (*tunica aciniformis*; from *acinus*, and *forma*, *resemblance*); a name for the uvea acinus, the tumor otherwise named STAPHYLOMA, which see.

AC'ME, (ἀκμη, from α, neg. and καμνω, to be *weary*); a term applied by physicians to that period of a disease in which it is at its height. Thus, the antients distinguished diseases into four stages: 1. The *arche*, beginning or first attack. 2. The

anabasis, or growth. 3. The *acme*, or crisis. 4. The *paracne*, or decline, as applied to man, see AGE.

ACONITUM; also called *Camarum*, *Canicida*, *Cynococtanum*; WOLF'S-BANE. Of this plant, various derivations are given by etymologists; as 1st, ακονη, a *whetstone* or *rock*, because it grows on bare rocks. 2dly, α negative, and κονις, *dust*, because it grows without earth. 3dly, ακων, ακη, a *dart*, because they poison darts therewith. 4thly, ακονιζομαι, *to accelerate*, for it hastens death.

Botanists have noticed nineteen species, some of which are called LYCOCTONUM. All these herbs are destructive by their caustic and suffocating quality; the animals that eat them having their power of swallowing stopped, and stomach corroded.

The *monk's-hood*, or *common blue wolf's-bane*, of which Dr. Storck speaks so much in favour, is the ACONITUM NAPELLUS, or *aconitum foliorum laciniis linearibus*, *superne latioribus*, *linea exaratis* Linn. It is a perennial plant, having many stalks arising from one root, alternative petiolated leaves divided into five parts, each portion cut into linear segments; and terminal bunches of irregular blue flowers with five petals, many stamina, and three pistils, succeeded by three capsules containing seeds. It is a native of various parts of Europe. It is found too in the mountainous parts of Virginia and Switzerland, and cultivated in gardens, in Britain, as an ornament.

Blue wolf's-bane, when first gathered, has a strong smell, but no peculiar taste. Dr. Woodville asserts, that every part, but especially the root, is one of the most virulent of the vegetable poisons. It occasions giddiness, convulsions, violent purgings both upwards and downwards, faintings, cold sweats, and even death itself. Dr. Stork's formula was two grains of the inspissated juice rubbed down with two drachms of sugar. Ten grains of this was given night and morning, and increased gradually to the quantity of six drachms twice a day. In several instances, this was given from gr. vj. to ℥ſs. three times a day, with the happiest success. Its chief sensible effect was its exciting a copious perspiration.

The cases in which Dr. Storck asserts that he succeeded by the internal use of this plant, were an *inveterate gonorrhœa*, *obstinate pains* which followed agues and intermittent fevers, *tophs* and *nodes*, *scirrhous tumors*, *indurations of the parotid gland*, *spina ventosa*, *itch*, *amaurosis*, *gouty* and *rheumatic affections*, *convulsive disorders*, and an *anchylosis*. Some have given it in tincture; one part of the dried leaf to six of proof spirit; the dose, forty drops. The extract has often been given from one grain, gradually increased to ten, for a dose; indeed some have carried it much further.

Its poisonous effects are shewn in the case of a person who had eaten a small quantity of monk's-hood, and was presently attacked with the following symptoms. He felt a sensation of tingling heat in his tongue and jaws, his teeth seemed to himself as if they were loose, and his face as if it was swelled. This tingling sensation gradually spread all over his body, particularly to the extremities; the knees and ankles lost their strength, and frequent twitching of the tendons came on. Soon after, he perceived a sensible check to the circulation of the blood through the limbs; at length a giddiness came on, then a mist seemed to collect itself before his eyes; in his ears was a humming noise, his senses failed, and, falling into a swoon, his eyes and teeth were fixed, his nose contracted, breathing short, and cold sweats were perceived on his hands, feet, and forehead. All these symptoms followed in less than two hours from the time of eating some sallad, in which the monk's-hood unfortunately was mixed. As it was suspected that he had taken some kind of poison, his friends forced into his stomach a quantity of oil and water, and afterwards some carduus tea, by which he vomited. These were repeated so as to encourage a thorough discharge from the stomach, and, in the intervals, a few spoonfuls of a stimulating cordial were given; and thus he soon afterwards recovered.

Some writers say, that the napellus is not poisonous in Sweden, Poland, &c.; but it should be noted, that the napellus which is not poisonous, is the *aconitum lycoctonum luteum majus* of Bauhine, or *yellow salutiferous monk's-hood*. See LYCOCTONUM.

ACONITUM ANTHORA, the systematic name for the *anthora*. See the Article ANTHORA.

A'COR, (from *acer*, *sharp* or *bitter*), another name for acidity. It is sometimes employed as synonimous with acid.

A'CORUS CALAMUS; the systematic name for the plant called *calamus aromaticus*. See CALAMUS AROMATICUS.

ACORUS PALUSTRIS. See the article GLADIOLUS LUTEUS.

ACORUS VERUS. See the article CALAMUS AROMATICUS.

ACORUS VULGARIS. See the article GLADIOLUS LUTEUS.

ACO'USTIC, (from ακουω, *to hear*), belonging to the sense of hearing. It is applied both to the auditory nerve itself, and also to medicines or instruments used to assist, preserve, or recover hearing. See EAR.

The beneficial use of acoustic tubes, or *hearing-trumpets*, as they are popularly called, depends on two points: 1. That the sound is put into a stronger vibrating motion through the medium of the metal, and at the same time; 2. That a resonance, and new reflection of the sound, is produced.

The sound increases and becomes stronger by these instruments; but, if they are not properly

constructed, it is likewise made less distinguishable. The best acoustic tubes are the most simple ones, either quite straight, or with a little curvity. It is also essential, that they have a wide opening to receive a greater portion of sound, and by which it is brought at the same time more condensed to the organ of hearing. Those that are much curved, have no great effect, and likewise the inconvenience, that, on account of their curved line, they cannot be worked so even by the artist. The same may be said of the conoidical tubes, in which the sound ceases to be reflected at the place where the angle grows greater than a right one, and becomes retrograde; because, according to Mr. Lambert's Observations on Acoustic Instruments (a German work), the angles of reflection increase like unequal numbers; and the last which can be admitted must not exceed 90 degrees. The form of an entire cone is, therefore, by no means calculated for propagating the sound, which, having entered, goes out again, without reaching the top of the cone. The parabolic form is the fittest for the construction of acoustic tubes, into which the sound enters in a direction parallel with the axis, and is by reflection concentrated as it were in a focus. Acoustic instruments, with an hemisphere to them, are inferior to these, because the sound is only reflected from the centre, and at the same time not so easily intercepted.

However, it seems that the construction of these instruments has not been brought to so great a perfection, as not to admit some improvements founded upon practice and experience. For the purpose of promoting this, Mr. Arneman has given to the public, figures and descriptions of those that have proved most useful by experience, and he invites all practitioners in Germany, who have had an opportunity of making observations on this subject, to communicate any instrument of the kind they have applied with success. By this means much would be contributed to a more perfect and sure method of diminishing those inconveniences arising from difficult hearing, for which so many seek advice and relief in vain; against an evil, which makes men unfit for enjoying life through the most interesting mean, that of communicating and receiving ideas by word of mouth. The public would be much benefited if the practitioners of this country would impart their experience on the subject, and contribute to such an useful and humane undertaking.

The inventor of the instrument represented in plate III. is not known, but it belongs certainly to the best of the kind that has been contrived. It is made of thin brass or copper, and should not weigh more than eight ounces, whereby it becomes very portable, and may as well serve for the right as for the left ear. To enable any artist to make this instrument accurately, it has been thought proper to add the dimensions of the different parts of which it is composed. H G I F is the cup, of which H I has 3 Paris inches 6 lines in diameter. F G = 2 Paris inches 10 lines. H F is = 3 Paris inches 1 line. F G is the bottom of the cup, which must particularly be made with exactness, because the use of the instrument depends in a great measure on its construction. It may be made as the segment of a circle whose radius is = 2 inches 7 lines Paris; but it is still better to give a parabolic form to the segment, whose focus is 1 inch Paris. For this purpose, it is necessary to work after a certain model or standard, of which fig. 2 gives an idea; after which the bottom must be accurately made. The inside ought to be smooth and well polished, the whole afterwards soldered on, when the instrument is put together. The others are, that which receives the sound, D E, and the conducting tube, which carries it to the ear, K L B. The former is to be performed in the same parabolic form as the bottom of the cup, and must therefore be exactly worked after the above fig. 2, except that its chord is by 4 or 5 Paris inches smaller than the bottom. In the middle of this part, D E, a hole is made, whose diameter is 1 Paris inch 2½ lines, which is at the same time the lower diameter of the tube K L, its upper diameter in A being only 6 lines. The length of the tube from K L to A, is 5 inches 10 lines. This must now be bent in such a manner, that K L and A make an angle of 90 degrees. Being well polished inside, the part D E is soldered into it, and the whole conducting tube fastened to the cup in I L, so that D E is equally distant from all sides of the cup in an exact horizontal direction, and the focus of the part D E likewise sufficiently distant from the focus of the bottom. In A another piece of tube is put on, of nine inches in length, and fastened to it by means of a ring on the former A, at the distance of 1 inch from its end, with an opening in its periphery, through which a hook may pass, and turning this afterwards, the hook becomes one continuous piece. On the curvation in B, a top of bone, ivory, or horn is put, to prevent the ear being irritated and inflamed, which may otherwise be caused by the metal. The last part is the cover, H I, perforated with holes, of which fig. 3 shews the profile. The part A B being taken off, the instrument may be conveniently carried in the pocket. It can also be fastened to the body by ribbands, by means of two clinchers in M M, and thus even used in field sports, &c.

Prof. Arneman proceeds to examine the different instruments that have been proposed as hearing-trumpets. The instrument, fig. 3, has been much recommended, though it appears, from its construction, to be far inferior to that we have already described. It consists of a hemisphere made of brass, ABC, fig. 1, whose radius is = 23‴ Paris

lines, and its diameter consequently at AC = 2 + 23‴ = 3″ inches 10‴ lines. On it is fastened the cover, which is convex, and perforated with many holes. At CK is an opening 11‴ in diameter, into which goes a conical conducting tube, 16″ long, the diameter of which has, at GZ, = 10‴, and its opening at OP, = 4‴. For greater convenience, the tube may be taken in pieces, as appears at NMC. At OP, or that part of the conducting tube which is applied to the ear, it ends in a top, which is generally made of tin, for the purpose of shutting the meatus auditorius; but as experience has shewn, that the continual touching of a metal generally hurts the ear, it would be advisable to have the top made of ivory, bone, or horn. The conducting tube penetrates into the middle of the hemisphere, where it is cut off in an oblique direction FG, to which is soldered a conical receptacle, the bottom of which is oval, as is seen in fig. 1, HJK. This receptacle is intended for intercepting the sound, when it is reflected from the interior surface of the hemisphere; but as it seems to be placed in a wrong position, it is more calculated to confound the sound, than to conduct it properly. In order to convince the reader of what we have here stated, and to shew, that from the construction of that instrument it is impossible it should answer its purpose, fig. 2 is added, to demonstrate how the reflection of the sound proceeds: it represents the same acoustic tube; likewise how the rays of sound fall in, and how they are again reflected; these are figured in ABCDEF. It ought here to be first considered, that the point of concentration of the rays of light, as well as of sound, fall into the middle of the radius of the inner superficies of a globe, which is, in this figure, at O. This, however, is only the case with rays that fall in near the axis; the rest are not so far propagated, declining the more and more from that point, by which means a confusion and want of distinction is produced. Hence it appears, that the conical receptacle HIK, intended for the interception of the sound, has not the proper form, but that the rays, before they reach it, diverge, and that the ear, for being able to understand every thing clearly and accurately, ought to be placed at O. The hemispherical form is likewise of no utility; and by examining the reflection of some rays, it will be shewn, that it is not proper to convey the sound clear and accurate. The ray *f* for instance, is reflected in the same direction as it comes in. A, a ray more distant from the center, is reflected at *a*, and consequently does not reach that point where it could be conducted by the intercepting receptacle: the same may be said of B*b*, which being rebounded against the opposite side, passes out in the same direction it fell in. From this it will be understood that all rays from A to B are of no use at all, but rather confound the sound; and those that fall in from B to C spring back in the same direction they came in, without affecting the ear at all. The ray C is therefore the first that touches the receptacle, and gets into the conducting tube, though it is likely to be dispersed by being reflected with very acute angles, as is seen in fig. 2, at *c c c*. The ray D rebounds also against the tube, but is reflected with larger angles, increasing by degrees; whence it appears, that the conducting tube must always be a determined length, if the sound is to be perceived by the ear. The line *d d d*, shews the reflection of this ray: the direction in which the ray E is reflected, is seen in *e e*. This may suffice to shew, that only a small part of the rays of sound, which fall in between C and D, are properly conducted and perceived by the ear, the rest becoming quite useless. This instrument seems, therefore, not to be properly calculated to convey the sound clearly and distinctly to the organ of hearing; a statement which experience has likewise confirmed, as it was used by several people without the expected success.

ACOUSTICS, (ακουστικα, from ακουω, to hear); those medicines which are employed with a view to restore the sense of hearing when deficient. See Acoustic.

A'CRACY, (ακρασια; from α, privative, and κρατος, strength); a term denoting debility, or impotence, from relaxation or a loss of tone in the parts.

A'CREA, (ακρον, extreme); the human extremities; as the nose, arms, legs, &c. The extremity of the nose is called Acre.

A'CRIA, a term applied by Dr. Cullen to such plants as are simply acrid, without any aromata or bitterness joined. He thinks many of them might be transferred from the list of *stimulants* to that of *evacuants*, as diuretics, &c. See Aliment.

ACRID, (from *acris*, *sharp)*, a term employed in medicine to express a taste, the characteristic of which is pungency joined with heat; also the topical effect of matter on a part.

ACRIMONY, (*acrimonia*, from *acris*, acrid). This term is used to express a quality in substances by which they irritate, corrode, or dissolve others. It has been supposed by Cullen and others, that there are acrimonies in the blood, which produce certain diseases; and although the humoral pathology is nearly exploded, the term venereal acrimony and some others are still necessarily retained.

According to Dr. Cullen, the medicines adapted to acrimony are of two kinds. First, those for acrimony in general, the *demulcentia*. Secondly, those suited to particular kinds of acrimony. Some writers, he says, have entered with great subtilty in their enquiries into the different kinds of acrimony, but it appears to him, that we are only well acquainted with two species, which are

the source of the rest, viz. the *acid* and *alkaline* acrimonies. Most part of what the human fluids are formed of, either are *originally* or have at least a *tendency* to become acid in the stomach, and, therefore, we may *suppose* an acid acrimony even sometimes to enter the system, and prevail there. Medicines which correct this acrimony are termed *antacida*. It is found to be the constant effect of the animal œconomy to convert the acid into an opposite acrimony. Some affirm, that this is a perfect alkali, but all agree it is of an alkalescent nature. The medicines against this acrimony Dr. Cullen has named *antalkalina*. The general indication for correcting acrimony, he thinks might have led to a division, first, into those medicines which correct, and, secondly, into those which obviate, acrimony. Those that obviate the too great acrimonious alkalescency of the fluids are set down under the title of *antiseptica*.

ACROMPHALON, (ακρομφαλον; from ακρος, *extreme*, and ομφαλος, the *navel*). The tip of the navel is thus named by the old writers.

ACROPOSTHIA, (ακροποσθια; from ακρον, *extreme*, and ποσθη, the *præpuce*); the extreme portion of the præpuce, or that part usually cut off in circumcision.

ACROTERIA, (ακρωτηρια; from ακρος, extreme); the extreme parts of the body, as the hands, feet, nose, &c.

ACROTERIASMUS, (from ακρωτηρια, *extremities*, and this from ακρος, *summus*); the amputation of an extremity.

ACROTHYMIA, ACROTHYMION, (from ακρος, *extreme*, and θυμος, *thyme*, from being the colour of thyme). See NÆVUS. A sort of wart, described by Celsus, as hard, rough, with a narrow basis, and broad top, which is of the colour of thyme, and easily splits and bleeds. This tumor is also called *thymus* by the old writers.

ACTION (*actio*, from αγω, *to act*); the same as *function*, or *faculty*. The actions or functions of the human body are divided into the *vital*, *natural*, and *animal*.

1. The *vital functions*, or *actions*, are those which are absolutely necessary to life, and without which animals cannot exist, as the action of the heart, lungs, and arteries. On the action and reaction of the solids and fluids upon each other depend the vital functions, of which the pulse and respiration are the external signs. Those diseases which hinder the influx of the venal blood into the cavities of the heart, and the expulsion of the arterial from the same, materially obstruct the vital actions.

2. The *natural functions* are those which are instrumental in repairing the several losses which the body sustains; for life is destructive of itself, its very offices occasioning a perpetual waste. The manducation of food, the deglutition and digestion of it, also the separation and distribution of the chyle and excrementitious parts, &c. fall under the head of natural functions, as by these the aliment is applied to the sustentation of our bodies.

3. The *animal functions* are those which we perform at will, as muscular motion, and all the voluntary motions of the body. They are those which constitute the senses of touch, taste, smell, sight, hearing, perception, reasoning, imagination, memory, judgment, affections of the mind. Without any, or all of these, a man may live, but his state will be very imperfect.

Each part of the body, however, has an action peculiar to itself. Thus whatever is performed by the muscles, vessels, glands, and viscera, may be called their respective *actions*.

ACTON-WATER; a purging water procured from *Acton*, a town near London, where is a well that affords it. From a gallon of this were obtained 340 grains, or five drachms two scruples of sediment by evaporation. Of this five drachms and twenty-one grains were vitriolated magnesia, or vitriolated absorbent earth, which took forty-eight times its own weight of water to dissolve it; and nineteen grains of earth, which did not calcine to lime, but dissolved in the vitriolic acid. This is one of the strongest purging waters near London. It has been drank in the quantity of from one to three pints in a morning; but however beneficial it may have proved in scorbutic and cutaneous affections, for the removal of which it seems very well calculated, this medical spring is no longer resorted to by the public.

ACTUAL CAUTERY. The term *actual* is applied to any thing endued with a property which acts by an immediate power inherent in itself. It is the reverse of *potential*. Thus, a red-hot iron, or other body on fire, applied to the skin, is called an *actual cautery*, in contradistinction from caustic applications, which are called potential cauteries. Boiling water is actually hot; but ardent spirits, producing heat in the body, is potentially hot, though of itself cold.

ACTUATION (*actuatio*, from αγω, *to act*); that change wrought on a medicine, or any thing taken into the body, by the vital functions, which is necessary to make it act, and have its effect.

ACUITION, (*acuitio*, from *acuo*, *to quicken*); a term applied to medicines which are added to others weaker than themselves, in order to increase their activity, as in the case of mild purgatives, which may be quickened by the addition of small doses of those which are more powerful.

ACULEATO-CILIATUS, (from *aculeus*, *a prickle*, and *cilium*, *the eye-lash*); a botanical term for those vegetables which are beset with bristles or points, like the hair upon the eye-lids.

ACU'LEI, (dim. of *acus, a point)*, the prickles and thorns on vegetables.

A'CULON, or ACULOS, the fruit or acorn of the *ilex*, or scarlet oak (from *α*, *non, and* κυηλοω, *to roll round)*; this is called aculon therefore, because its fruit is not involved in a cup or sheath, like the others.

ACUMINA'TUS, (from *acumen)*, terminating in a long *tapering* point. In botany this differs from *acutus*.

ACUPUNCTURE, *(acupunctura*, from *acus, a needle*, and *pungo, to prick)*; bleeding, performed by making many small punctures with a silver needle on the part affected. This method is practised in Siam, Japan, and other oriental nations, on all parts of the body; and employed in head-aches, lethargies, convulsions, colics, &c. In some parts of America this practice is also in use, if we may credit the accounts given in Dampier's Voyages.

A'CUS, (from *acuo, to sharpen)*, a needle. See NEEDLE. This instrument is necessary in confining the lips of wounds, taking up and tying blood-vessels, &c. They are of various forms, according to the use for which they are designed; and it is of considerable importance that they should be sharp, and made of metal that is well-tempered.

A'CUS PASTORIS, shepherd's needle. See SCANDIX. For that called Moschata, see GERANIUM MOSCHATUM.

ACUTE DISEASE (*Morbus acutus*), that disease which is attended with an increased velocity of the blood, terminates in a few days, and is attended with danger. It is opposed to a chronic disease, which is slow in its progres, and not so immediately dangerous. See DISEASE.

ACUTENACULUM, a contrivance not now in use. Heister calls the *portaiguille* by this name. It is the handle for a needle, to make it penetrate easily when stitching a wound.

ACY'ISIS, (from *α* non. and κυω, *to conceive)*, a term used in VOGEL's Nosology, denoting a defect of conception, or barrenness, in women.

ACY'RUS. See ARNICA MONTANA.

ADAM'ITA, or ADAMITUM, (from *adamas, a diamond)*, names given to the hardest white stones. *Adamita* is properly the stone in the bladder; *adamitum*, the lithiasis, or disease called the stone. See CALCULUS.

ADAM'S APPLE. See the article POMUM ADAMI.

ADAM'S NEEDLE, the *Yucca gloriosa* of Linnæus. The roots of this plant are thick and tuberous, and are used by the Indians instead of bread in times of scarcity; being first reduced into a coarse meal.

ADANSO'NIA, from *Adanson*, the name of the person who first described it; the Æthiopian sour gourd. See BOABAB.

ADARCE, (from *α* neg. and δερκω, *to see)*; a saltish concretion, from about the reeds and grass in marshy grounds in Galatia, which prevents the herbs upon which it forms from being seen; hence its derivation: it is also called *calamohanus*, or *calomochnus*. It is lax and porous, like bastard sponge. It is used in cutaneous diseases, as we are told by Dr. Plott, who gives an account of this production in his Natural History of Oxfordshire.

ADARTICULA'TIO, (from *ad*, and *articulus, a joint)*. See DIARTHROSIS.

ADDEPHAGIA, (of the Greek αδδηφαγια; from αδδην, abundantly, and φαγω, to eat); insatiability; a voracious appetite. See BULIMIA.

ADDITAMENTUM, a term formerly employed as synonimous with *epiphysis*, but now only applied to two portions of the sutures of the human skull. See LAMBDOIDAL and SQUAMOUS SUTURES.

ADDITAMENTUM COLI. See APPENDICULA CÆCI VERMIFORMIS.

ADDUCTOR, (from *ad* and *duco*, to *draw to)*, a name given to several muscles, whose office is to bring forwards or draw together those parts of the body to which they are annexed. They occur, in the human subject, in the following instances:

1. *Adductor ad minimum digitum.* This rises from the unciform process of the carpus towards the annular ligament, and is inserted into the whole length of the inside of the metacarpal bone of the little finger.

2. *Adductor auris.* This is a common muscle, being a part which Spigelius calls *quadratus buccas detrahens;* from its insertion is a fleshy fibrous elongation implanted into the root of the ear.

3. *Adductor digiti minimi pedis*, called also *transversalis pedis.* It rises from the fourth metatarsal bone, and, going over the knobs of the toes, runs to the external sesamoid bone. It brings the third and fourth lesser toes nearer to the other two, and the great one.

4. *Adductor femoris primus*, vel *longus.* It rises from the os pubis, next the pectinæus, above the gracilis; which turning into a compact fleshy belly, it begins to be inserted tendinous about the middle of the linea aspera, being continued down upon the same five or six inches, sending out a tendon which joins in with that of the fourth head.

5. *Adductor femoris secundus*, vel *brevis.* It arises from the os pubis, immediately under the gracilis, by a broad tendinous, but chiefly fleshy beginning, and is inserted into the linea aspera, from a little below the lesser trochanter, to the first insertion of the last described muscle.

6. *Adductor femoris tertius*, vel *magnus.* It arises lower down than the former, from the outer edge of the os pubis and ischium, and, running obliquely towards the trochanter minor, is inserted near the glutæus maximus. This and the next muscle are described as one muscle, by Albinus and Winslow, under the names of *Abductor mag-*

nus femoris, and *le troisieme muscle du triceps.* It is also called *triplex musculus.*

7. *Adductor femoris quartus.* It arises from the protuberance of the ischium, and the adjoining inferior part of that bone, by a tendinous or fleshy origin. It is inserted by a round and a long tendon into the upper and rough part of the inner and lower appendix of the os femoris, being affixed to that bone a little above the condyle, as also to some part of the linea aspera. The above four muscles of the thigh are described by Dr. Hunter, and other anatomists, as one, and under the name of Triceps, which see. Their use is to *adduce*, or move inwards, the thigh, according to their different directions, and also to bring them to each other.

8. *Adductor oculi*, also called *adducens* and *rectus internus.* It rises tendinous and fleshy from the edge of the hole in the sphenoid bone that transmits the optic nerve, and is inserted by a thin tendon into the tunica sclerotica, where it respects the great canthus. It brings the eye towards the nose. Some have fancifully called it *bibitorius*, as it directs the eye toward the glass in drinking.

9. *Adductor pollicis manus ad indicem.* Riolan calls it *antithenar.* It rises from the fore part of the metacarpal bone of the fore-finger, joins with the anterior portion of the flexor secundi internodii pollicis, and is inserted with it into the sesamoid bone. See Abductor Indicis.

10. *Adductor pollicis pedis.* It rises by a long thin disgregated tendon from the os calcis, under the tendinous part of the massa carnea, from the os cuboides, the os cuneiforme medium, and from the upper part of the os metatarsi of the second toe; it is soon dilated into a pretty large belly, and is inserted in the external os sesamoides of the great toe. Douglas says it brings the great toe near to its next neighbour.

ADEN, (Αδην, a *gland)*, a name given by the old writers to this part when inflamed or suppurated.

ADENIFORM, *(Adeniformis*, from αδην, a *gland*, and *forma*, *resemblance)*; glandiform, or resembling a gland; a term sometimes applied to the prostate gland by the old writers.

ADENOGRAPHIA, (αδηνογραφια; from αδην a *gland*, and γραφω, to *write)*; Adenography, or a treatise on the glands.

ADENOLOGIA, (αδηνολογια; from αδην, a *gland*, and λογος, a *discourse)*, the doctrine of the glandular system. See Gland.

ADENOUS, *(adenosus;* from αδην, a *gland)*, a term applied to a tubercle, or any hard glandular part, which suppurates imperfectly.

ADEPS, an oily secretion from the blood into the cells of the cellular membrane. See Fat.

ADEPT PHILOSOPHY, that system of self-delusion, falsely called philosophy, whose end was the transmutation of metals, and an universal remedy. The professors of this philosophy, now only the objects of ridicule, were called *adepti*, adepts. Paracelsus calls that, medicina *adepta*, which treats of the diseases that are contracted by celestial operations, or communicated from heaven.

ADHATO'DA; the *Malabar nut.* There are two species, viz. the *adhatoda Zeylanensium*, or, common Malabar nut; and the *adhatoda Indica*, *seu adhatoda hyssopi foliis:* the willow-leaved Malabar nut, commonly called the *snap-tree.* These are of the genus called, by Linnæus, *justicia.* The virtue ascribed to the Malabar nut is that of an emmenagogue, and to expel the dead fœtus; that being the meaning of *adhatoda* in the original language.

ADHESION, (from *adhæreo*, to *stick to)*; the growing together of parts.

ADHESIVE INFLAMMATION, that species of inflammation which terminates by an adhæsion of inflamed surfaces to each other. Thus the pleura of the lungs, when inflamed, unites to that of the ribs. See Inflammation.

ADHESIVE PLASTER, a kind of plaster, calculated solely to confine the parts to which it is applied in a particular situation, as in the case of an incised wound, the sides of which are to be brought into contact and healed by the first intention. The Edinburgh Dispensatory gives it the name of

Emplastrum resinosum. Edin.

Take of Plaster of litharge, five parts;
White resin, one part.
Melt them together, and make a plaster.

Emplastrum Lithargyri cum Resina. Lond.

Take of Litharge of plaster, three pounds;
Yellow resin, half a pound.
To the litharge plaster, melted over a very slow fire, add gradually the powdered resin; mix them well, and make a plaster.

These plasters are likewise highly convenient to use as adhesives for keeping on other dressings, for giving mechanical support to new flesh, and contracting old ulcers, in the manner recommended by Mr. Baynton. See Ulcer.

ADIA'NTHUM, (αδιαντον; from α, neg. and διαινω, to *grow wet;* so called because its leaves are not easily made wet); Maiden-hair. It is the *adianthum capillus veneris; frondibus decompositis, foliolis alternis primis cuneiformibus lobatis pedicillatis Linn.* It is also called *polytrichon* and *polytrichum*, (from πολυς, *much*, and θριξ, *hair)*; expressive of a capillary vegetable.

Maiden-hair is an evergreen low plant, with slender, smooth, shining, blackish stalks, without any manifest flower: the seeds are a fine dust,

lying in roundish specks about the edges of the backs of the leaves, which curl over and cover them. Five species are noticed by botanists.

1. *Adianthum verum;* the *capillus Veneris* already described. It is the *true maiden-hair*, found in Cornwall, and in the mountainous parts of Wales; but it is most plentiful in the south of Europe, as in France, Italy, &c.

2. *Adianthum Canadense;* also called *adianthum fructicosum Brazilianum*, avenqua; *adianthum Americanum*, et capillus Veneris *Canadensis*. It is the *adianthum pedatum* Linn. *American*, or *Canada Maiden-hair*. It is a native of America, but cultivated in our gardens, and is the strongest and most agreeable of all the sorts.

3. *Adianthum nigrum;* called *callitrichum*, *trichomanes*, and *polytrichum*. According to Linnæus it is the *asplenium trichomanes*, or *asplenium* frondibus pinnatis, *pinnis subrotundis crenatis—Class, Cryptogamia, Order, Filices*. Gen. Plant. 1178.

This last is the *common* or *English black maiden-hair;* a perennial plant, that grows wild on shady grounds, old walls, and rocks. It has a mucilaginous and roughish taste, but little or no flavour.

The other two species are the *Adianthum album* and *aureum*. But the three mentioned above only are deemed of any use; and *indeed the third supplies the place of them all*. These plants, as do all of the capillary tribe, abound with a saponaceous quality, which they give out to boiling water. Indeed, the best preparation is a strong infusion made with boiling water, and sweetened with liquorice root, to be drank freely in catarrhous affections of the lungs.

The French make a syrup of the true sort, and flavour it with orange-flower water. The Canadians also make a syrup of theirs, in which they use maple-sugar. In England the confectioners prepare a syrup of it, which they sell be thy name of *syrup of capillaire*.

As the virtues of these herbs are contained in their mucilage, they lose nothing by drying. The flavour of the Canada species may suffer by the boiling; but, as a pectoral, that loss is of no consequence.

ADIAPNEU'STIA, (from *α* neg. and *διαπνευω*, *to perspire;* or *α* neg. *δια per*, and *πνευω to breathe);* IMPEDED PERSPIRATION, which was considered by the ancients as the primary cause of fever, from what they termed *vaporosa et fuliginosa effluvia*, not being permitted to pass through the habits and cutaneous pores, and hence productive of febrile affections.

ADIARRHŒ'A, (from *α* neg. and *διαῤῥεω*, *perfluo*, *to flow out* or *through);* a total suppression of the necessary evacuations from the bowels.

ADIPOSE MEMBRANE, *(Membrana adiposa*, from *adeps*, fat); the fat collected in the cells of the cellular membrane. See CELLULAR MEMBRANE.

ADI'PSIA, (from *α*, neg. and *διψα*, *thirst);* a want of thirst. It is a genus of disease in the class *locales*, and order *dysorexia* of Cullen's nosology. It is always symptomatic of some disease of the *sensorium commune*.

ADI'PSOS, (from *α* priv. and *διψα*, *thirst*). The EGYPTIAN PALM-TREE is thus named by the Greeks. Its fruit, before it is ripe, is called *myrobalans*. Theophrastus calls this tree *βαλαν*ος, i. e. *mast*, from its fruit; but it is called *adipson*, because its fruit, before it is ripe, quenches thirst. *Adipsos* is also a name for liquorice.

ADJUTO'RIUM, (from *adjuvo*, *to assist);* the HUMERUS, or upper arm, described thus by ALBUCASIS. "Adjutorium is that bone which lies between the cubit and head of the scapula." An external medicine used to assist internal ones, was also named adjutorium.

ADNATA TUNICA, *(from adnascor*, to *grow to);* the *Albuginea oculi*, or *Tunica albuginea oculi*. This membrane is mostly confounded with the *tunica conjunctiva*. It is, however, thus formed: five of the muscles which move the eyes, take their origin from the bottom of the orbit, and the sixth arises from the edge of it; they are all inserted by a tendinous expansion into the anterior part of the *sclerotica;* which expansion gives the whiteness peculiar to the fore part of the eye. It lies betwixt the *tunica sclerotica* and the *tunica conjunctiva*. See EYE.

ADOLESCENCE, (from *adolesco*, to *grow*), that period of human life which is intermediate between childhood and the adult state. See AGE.

ADOPTER, a chemical implement used to connect retorts to cucurbits or matrasses in distillation, with retorts instead of receivers.

A'DOR, a sort of corn, (from *α* neg. and *δορυ*, *a spear*), so named from its being without the beard or spear; also called *spelta* and *zea*, SPELT CORN. Dioscorides mentions two kinds of it, the *monococcous* and the *dicoccous*, that is such as has only one grain or two in a husk.

ADRA RHI'ZA, (from *αδρος*, *thick*, and *ῥιζα*, *a root)*. A name for Aristolochia, because it abounds in roots. See ARISTOLOCHIA.

ADROBO'LON, (from *αδρος*, *large*, and *βωλος*, *a globe*, or *mass)*, a name for the Indian *bdellium*, which is coarser than the Arabian, being impure, black, and in large lumps, whence its name.

ADSTRI'CTION, *(adstrictio*, from *ad*, and *stringo*, *to bind together);* a term which either expresses the styptic quality of medicines, or the

retention of the natural evacuations. See CONSTIPATION.

ADSTRINGE'NTIA, (from *adstringo*, *to bind up)*, adstringent or ASTRINGENT medicines. See ASTRINGENTS.

ADVENTITIOUS, in an anatomical sense, any thing that accidentally, and not in the common course of natural causes, happens to make a part of another; as the glands in strumous cases are said to be *adventitious glands*, in distinction from those which are naturally produced. It is also used in medicine, in opposition to hereditary. Thus the gout and scrophula are sometimes hereditary, and sometimes adventitious; having never before occurred to any individual in the family.

ADULTERATION (from *adultero* to *counterfeit)*; the practice of adulterating, corrupting, or counterfeiting genuine medicines. He who counterfeits medicines is often both a robber and murderer, and yet there are persons who pass for honest men in the world, who systematically practice this infamous fraud on the purses and lives of their fellow creatures. See MEDICINES.

ADU'STA, (from *aduro*, *to burn up)*; adust, burnt, scorched, or parched. It is a term applied by some writers to the temperament or complexion.

A'DY, vel PA'LMA A'DY, (from αδυ, or ἡδυ, probably, *sweet)*; a palm-tree in the island of St. Thomas, which affords plenty of juice that ferments into wine. The entire fruit is called by the Portuguese *caryoces* and *cariosse*; the natives call it *abanga*. The fruit externally is like a lemon, and contains a stone, the kernel of which, if heated in hot water, gives out an oil of a saffron colour; it concretes in the cold, and is used as butter: of these kernels the inhabitants give three or four as a restorative, two or three times a day.

ADYNA'MIA, (from α neg. and δυναμις, *strength* or *force)*, languor, weakness, impotence from sickness or disease: *adunatos*, *leipopsychia*. Also drowsiness, or sleepiness, lassitude, defect of vital powers, as in *syncope*, *dyspepsia*, and *hypochondriasis*. In Dr. Cullen's Nosology, this word distinguishes an order in his class *neuroses*. He defines it to be diseases consisting in a weakness or loss of motion, in either the vital or natural functions.

ADYNAMIA, (αδυναμια; from α, priv. and δυναμις, *power)*. A defect of vital power. This constitutes the second order of the class *neuroses* of Cullen's nosology; and comprehends, *syncope*, *dyspepsia*, and *hypochondriasis*. See those ARTICLES.

ÆDOIA, (Αιδοια; from αιδως, *modesty;* or from α, neg. and ειδω, to *see;* as not being decent to the sight). The pudenda, or parts of generation.

ÆDOSO'PHIA, (from αιδως, *pudenda*, and ψοφεω, *strepitum edo)*; in the Nosology of Sauvages, also of Sagar, is defined to be a *flatus* passing from the uterus, or from the urinary bladder, through the vagina or the urethra; hence is it formed into two species, *ædosophia urethræ et uteri*. This flatus is sometimes very fœtid, which circumstance cannot always be accounted for. It sometimes happens when women are in labour, and hath been taken for a sign that the child is dead, but this cannot be depended on. An intolerable stench, it is said, however, sometimes attends when the child is living.

Æ'GER, (from αγρος, *languid)*; *sick*, abated from the usual state of health. See DISEASE.

Æ'GIAS, (from αιξ, *a goat)*. A white speck on the pupil of the eye, which occasions a dimness of sight; so named, because it was supposed that goats were subject to it.

ÆGRITU'DO BOVI'NA. See BOVINA AFFECTIO.

Æ'GYLOPS or Æ'GILOPS; a disease in the inner corner of the eye, (so called from αιξ, a *goat*, and ωψ, *an eye*, or *goat's-eye)*, because goats are said to be subject to this disease. *Anchylops* and *ægylops* are but different states of the disorder called *fistula lachrymalis*. The *ægylops* is the fistula lachrymalis beginning to discharge pus. There seems to be no good reason why the distinction of the ancients should be at present neglected with respect to the anchylops and ægylops, and a general term adopted, which is, in itself, highly absurd. Surely to denominate a complaint fistulous, where no fistula exists, must be improper; and the two different species, as well as a third, are styled fistula lachrymalis by the moderns. Some of the ancient physicians considered the lachrymal sac in its state of tumefaction as an anchylops; when ruptured an ægylops; and certainly the distinction ought to be preserved. See FISTULA LACHRYMALIS.

Æ'GYLOPS, or A'GILOPS; the plant otherwise named *Avena sterilis*, *Bromus sterilis*, *Festuca avenacea*, *Gramen avenaceum*; *great wild oat-grass* or *drank*. The roots of this are full of small fibres, several stalks rise from a root, and are joined. It grows in hedges and the sides of fields in May. By culture it becomes a species of corn. In the northern parts of America it is improved to great advantage; and in the low wet boggy grounds in Great Britain it would be profitable, perhaps, beyond any thing else, as it thrives best in water. It grows like the oat, but in quality is more of the rice kind. A decoction of the roots is reckoned a good anthelmintic.

ÆGYPTI'ACUM, or MEL ÆGYPTI'ACUM, an ointment so called from its being said to be of Ægyptian origin. Mesne is its supposed author.

This ointment now is properly rejected, and its place supplied by the *Oxymel Æruginis* or *Oxymel of Verdegrise*, which see.

ÆNE'A, an epithet formerly given to the instrument called a catheter, from *æs*, *brass*, the metal of which it was formed.

AEROLOGY. See AEROLOGICE.

AEROLOGICE, (αηρολογικη; from αηρ, air, and λογος, a discourse); *Aerology*, or that part of medicine which treats of air, explains its properties and use in the animal œconomy, and its efficacy in preserving and restoring health. See ATMOSPHERE.

AEROPHOBI, (αηροφοβοι; from αηρ and φοβος, fear). According to Cælius Aurelianus, some phrenitic patients are afraid of a lucid, and others of an obscure air; and these he calls *aerophobi.*

AEROPHOBIA, (αηροφοβια; from αηρ, air, and φοβος, fear), a dread of air; an occasional symptom of phrenitis.

ÆRU'GO, VERDIGRISE; the *sub-acetis cupri* of the Edinburgh Pharmacopœia. It is copper corroded by a fermented vegetable acid, into a bluish green substance. The copper is made into very thin plates, which are suspended over the vapours arising from wine, during its acetous fermentation: or the husks and stalks of grapes are dried, and then, being bruised, are dipped in wine and made into balls, which are left to ferment until they acquire the acetous quality, when they are broken with the hand, stratified with the plates of copper, and left until the verdegrise is produced. The best verdegrise, as well as the greatest quantity, is made at Montpellier, where there is one sort in powder and another in lumps. The sort which we receive from France is generally mixed with the stalks, &c. of grapes, which may be separated by pulverization, they being more difficulty powdered than the verdegrise itself. To purify it, dissolve a quantity in six or seven times its weight of distilled vinegar, then decant and evaporate the solution. If good, it will be dry, of a beautiful deep green, with a few white spots; and when rubbed on the hand with a little saliva or water, it will form a smooth paste, free from grittiness. In spirit of wine, and in water, this concrete is partially soluble: in vinegar it is wholly so. If a saturated solution of it in vinegar be set to exhale in a warm place, the greatest part of the verdegrise may be recovered in a christalline form; and if these chrystals are distilled in a retort, the acetous acid ascends from them in a highly concentrated state, and the chrystals are then called *distilled verdegrise.* Pure acetous acid may be procured from the latter. See ACETOUS ACID.

Verdegrise is used in the arts, as well as in medicine. Externally it is used by surgeons to deterge foul ulcers, being first mixed with other ingredients, as in the mel æruginis, and *unguentum elemi cum ærugine* of the Pharmacopœia Chirurgica. In phagedænic ulcers, and ill-conditioned sores, with a fœtid discharge, this preparation of copper is useful. Venereal chancres too, that yield not to mercury inwardly, have yielded to it. Solutions of cuprum vitriolatum, oxymel æruginis, or other preparations of copper, by their stimulus, help nature to throw off sloughs, particularly in ulcerated sore throats. If taken internally, a vomiting is instantly provoked by a grain or two of verdegrise, so that, for its speedy effect, it may be used to discharge any poisonous matter received into the stomach. Large portions, as four drachms or more, have been swallowed without any other inconvenience than the present vomiting; yet, in smaller quantities, besides the vomiting, it excites a pain in the stomach and griping in the bowels, causes a tenesmus, ulcerations, and bloody stools, difficult breathing, contractions of the limbs, &c. which often terminate in death. Hence it is scarcely fit to be at all used in medicine, and great care should be taken of copper or brass vessels, in which acids or fats are boiled, lest the verdegrise accidentally obtained should be productive of diseases. It is worthy of remark, however, that acids, while boiling, do not corrode this metal; but a short space of time serves for the effect when the boiling heat is abated. In cases of verdegrise being swallowed, it has been the practice to give oil and warm water, or large quantities of milk and water, both by the mouth and by the anus, with a view to wash away the whole of the poisonous matter; to excite a speedy discharge by vomiting and by stool. After these these evacuations, an anodyne is usually given; and if there be great pain, musk, or other cordials, with a milk diet, are prescribed. Unpromising as these may seem, and unequal to the object in view, we are under the necessity of resorting to them for want of a more effectual method of counteracting this poison.

Verdegrise cannot be reduced to powder but by levigation. After this process it becomes the *Ærugo præparata* of the London College. The other officinal preparations of verdegrise are, the *Oxymel Æruginis*, *Acidum acetosum*, and the *Emplastrum meloes vesicatorii* Edin.

ÆSCULUS HIPPOCASTANUM, (from *esca*, food); the systematic name for the *Hippocastanum.* See HIPPOCASTANUM.

ÆSTUARIUM, a kind of stove or vapour bath for conveying heat to all parts of the body at once. *Ambrose Parey* calls by this name an instrument, which he describes for conveying heat to any particular part; and *Palmarius* describes a contrivance, under this name, which he employed for sweating the whole body.

Æ'STUS VOLA'TICUS, (from *æstus*, *heat*, and *volo*, *to fly*). Vogel places this word as synonymous with *phlogosis.* It is a sudden scorch-

ing heat, with redness of the face, that soon flies off.

ÆTHER, (from αιθηρ, a supposed subtile fluid); a liquor obtained by distillation from a mixture of alcohol and a concentrated acid; the name of the product varying according to the acid employed. The following are the ætherial preparations set down in the Edinburgh, London, and Dublin Pharmacopœias.

Æther Sulphuricus. Edin.

Take of Sulphuric acid,
Alcohol, of each thirty-two ounces.

Pour the alcohol into a proper glass retort, and add the acid in an uninterrupted stream. Mix them gradually by shaking them; this done, distil, from sand previously heated, into a receiver kept cool with water or snow. The heat should be such that the liquor may boil as soon as possible, and continue to do so till sixteen ounces are drawn off for use. Next add to the distilled liquor two drachms of potass; and distil from a high retort, with a very gentle heat, into a receiver, until ten ounces have been collected. More alcohol may be poured on the acid in the retort, and the distillation repeated, by which more ether will be obtained.

By the London College this preparation has the name of *Vitriolic Ether.*

Æther Vitriolicus. Lond.

Take of the Vitriolic ether, of the first distillation, two pounds by weight;
Water of pure kali, one ounce by measure.

Having shaken them together, with a gentle heat, draw off fourteen ounces by measure.

Vitriolic Æther is thus directed in the Dublin Pharmacopœia.

Æther Vitriolicus. Dubl.

Take of Ethereal vitriolic liquor, sixteen ounces;
Caustic alkali, in powder, two drachms.

Mix them, and distil with the precautions already mentioned.

Æther Sulphuricus cum Alcohol. Edin.

Take of Sulphuric ether, one ounce;
Alcohol, two ounces.

Mix them together.

Spiritus Ætheris Vitriolici. Lond.

Take of Rectified spirit of wine,
Sulphuric acid, of each one pound.

Pour the acid gradually into the spirit of wine, and mix them together; then distil with a gentle heat, from a retort into a tubulated receiver, to which another recipient is fitted. The spirit of vitriolic ether may be drawn till sulphureous vapours begin to arise. In another receiver, by continuing the distillation, a little *oil of wine* will be obtained.

Liquor Æthereus Vitriolicus. Dubl.

Take of Rectified spirit of wine,
Vitriolic acid, of each sixteen ounces.

Put the spirit into a proper glass retort, and pour upon it the acid in a continued stream. Mix them gradually, and having placed the retort in sand previously heated, distil the liquor into a cool receiver. The heat is to be so applied, that the mixture may boil as soon as possible; and the retort is to be removed when eight ounces have come over.

The officinal preparations of ether are the *Tinct. aloes æther.* and *Æth. sulphuricus aromaticus* Edin.

The etherial preparation called *Oil of Wine*, is noticed under the article WINE.

Spiritus Ætheris Vitriolici Compositus. Lond.

Take of Spirit of vitriolic ether, one pound;
Oil of wine, a drachm and a half.

Mix them together.

Liquor Æthereus Oleosus. Dubl.

The Dublin College direct what they denominate *Oily Ethereal Liquor*, for the preparation formerly called the

Anodyne Liquor of Hoffman.

Take what remains in the retort after drawing off the vitriolic ether.

Distil it to one-half the quantity with a moderate heat.

Dr. Andrew Duncan, in the "*Edinburgh New Dispensatory*," observes, that the products arising from the decomposition of alcohol by the different acids are extremely curious in their nature, which was not understood until lately. Their phenomena has been very ingeniously explained by Fourcroy and Vauquelin; who have endeavoured to shew that the acid remains unchanged, and that the alcohol is converted into ether, water, and carbon.

In preparing these fluids, the most convenient way is to mix the ingredients by putting the alcohol into a tubulated retort, and, with a long-tubed funnel which will reach to the bottom, pouring in the acid. By cautious agitation the two fluids unite, and heat is produced, which may be taken advantage of in the distillation, if we have a sand bath previously heated to the same degree, to set the retort into immediately after the mixture is completed; nor is there any occasion for a tubulated receiver, if we immerse the ordinary receiver, which ought to be large, in water, or surround it with a quantity of ice.

On adding the acid to the alcohol, there is per-

ceived a considerable increase of temperature, and a slight disengagement of alcohol, having an aromatic odour. On placing the retort in the sand bath, a portion of pure alcohol first comes over; and, when the mixture in the retort boils, the ether rises, and is condensed in thin, broad, straight streaks, having the appearance of oil. Until the liquor which passes over into the receiver amounts to about half, or somewhat more than half, of the alcohol operated on, it consists almost entirely of alcohol and ether, and there has been no production of any permanently elastic fluid: but now the product of ether ceases; the sulphuric acid is decomposed; and sulphureous vapours begin to arise, which condense in irregular streaks, or in drops: we must, therefore, either put a stop to the process, or change the receiver. In the latter case, the products are, sulphureous acid, acetic acid, water, and oil of wine, as it was called, accompanied towards the end by a peculiar species of carburetted hydrogen gas, called by the Dutch chemists *Olesiant gas;* because, when mixed with oxygenized muriatic acid, it forms oil. At last the matter in the retort becomes thick and black, swells up, and obliges the process to be discontinued.

If the process be interrupted before the sulphureous vapours arise, the whole acid, diluted with a proportion of water, and mixed with charcoal, remains in the retort; but, if the process is continued, there is a continual decomposition of the acid, which is therefore diminished in quantity. In either case, Proust says, the sulphuric acid may be obtained from the black residuum in the retort, by diluting it with twice its weight of water, filtering it through linen, and evaporating it till it acquire the specific gravity 1.84, then adding about one five-hundredth part of nitrate of potass, and continuing the evaporation until the acid become perfectly colourless, and acquire the specific gravity of 1.86 The residuum, however, may be more advantageously preserved, as the Edinburgh College direct, for preparing more ether, by repeating the process with fresh quantities of alcohol. Proust, indeed, denies that this residuum is capable of converting more alcohol into ether; but Dr. Lewis inserted this fact in the first edition of his dispensatory, in 1753. The ether may be separated from the alcohol and sulphureous acid, with which it is always mixed, by re-distilling it with a very gentle heat, after mixing it with lime, which combines with the acid, or with black oxide of manganese, which deprives it of its volatility.

The medical properties of ether are those of an antispasmodic, cordial, and stimulant. In catarrhal and asthmatic complaints, its vapour is inhaled with advantage, by holding in the mouth a piece of sugar on which ether has been dropped. It abates nausea, and is given in fevers of the typhoid type. As an antispasmodic, in hysteria, and in other spasmodic and painful diseases, and as a stimulus in soporose and apoplectic affections, it also enjoys some share of reputation. Regular practitioners seldom give so much as half an ounce, much more frequently only a few drops, for a dose; but empirics have sometimes ventured upon much larger quantities, and with incredible benefit. Applied externally, it is of service in the head-ache, tooth-ache, and other painful affections. Thus employed, it is capable of producing two very opposite effects according to its management; for, if it be prevented from evaporating, by covering the place to which it is applied closely with the hand, it proves a powerful stimulant and rubefacient, and excites a sensation of burning heat, as is the case with solutions of camphor in alcohol or turpentine. In this way it is frequently used for removing pains in the head or teeth. On the contrary, if it be dropped on any part of the body, exposed freely to the air, its rapid evaporation produces an intense degree of cold; and, as this is attended with a proportional diminution of bulk in the part applied, in this way it has frequently contributed to the reduction of the intestine in cases of strangulated hernia.

The different mixtures of ether with alcohol, whether prepared directly or indirectly, possess similar virtues with ether alone, but in an inferior degree.

The following is the Edinburgh *Spirit of Nitrous Ether*, or *Nitrous Ethereal Liquor* of the Dublin College.

Spiritus Ætheris Nitrosi. Edin.

Take of Pure alcohol, three pounds;
Nitrous acid, one pound.

To the alcohol, contained in a phial, and placed in cold water, add the acid by degrees, constantly agitating them. Place the phial, slightly covered, for seven days, in a cool place; then distil the liquor with the heat of boiling water into a receiver kept cool with water or ice, till all the spirit is drawn off.

Spiritus Ætheris Nitrosi. Lond.

Take of Rectified spirit of wine, two pints;
Nitrous acid, half a pound.

Mix these, by pouring in the acid, and draw off, with a gentle heat, one pound ten ounces.

Alcohol and nitrous acid act peculiarly upon each other, according to their proportions, a small proportion of alcohol only being used. For, if we pour alcohol into nitrous acid, there is immediately a great increase of temperature, violent effervescence, and a disengagement of red fumes. On the contrary, by placing the phials containing the alcohol and acid, in iced water, these may be mixed, without any danger, in the proportions

directed by the Colleges; and if the acid be added in small quantities at a time, and each portion thoroughly mixed with the alcohol by agitation, Dr. Duncan observes, that no action takes place until heat be applied. It is, therefore, unnecessary to keep the mixture for seven days; but we may immediately proceed to the distillation, which must be performed with a very slow and well-regulated fire; for the vapour is very apt to expand with so much violence as to burst the vessels. The heat must at no time amount to 212 degrees, otherwise a portion of undecomposed acid will pass over and spoil the product. By performing this operation carefully in a Woulfe's apparatus, he obtained from three ounces of alcohol and one ounce of nitrous acid, two ounces four drachms of spirit of nitrous ether. Eight ounces of alcohol, contained in the first phial, gained one drachm and a half, and specific gravity 873, and eight ounces of water in the second, 18 grains: the residuum weighed seven drachms and a half. There was therefore a loss of two drachms forty-two grains of permanently elastic fluids. The first portion that was examined seemed to be the air of the apparatus: in the next the candle burnt with an enlarged and brightened flame: was it nitrous oxide? and all that passed afterwards was a mixture of carbonic acid and the etherized nitrous gas first described by the Dutch chemists. When recently prepared, this gas is inflammable, and does not form red fumes, when atmospheric air is admitted to it: but when attempted to be kept over water, the water becomes acidulous, the gas is diminished in bulk about two-thirds, has lost its inflammability, and is now converted into red vapour on the admission of atmospheric air. It therefore appears to consist of nitric oxide gas, holding ether in chemical solution. We may form a similar gas, by admitting a few drops of ether to nitric oxide gas over mercury. The Edinburgh and Dublin Colleges direct the distillation to be continued till no more spirit comes over. But the difficulty is, how this is to be ascertained. After having drawn off about two thirds, according to the directions of the London College, Dr. Duncan applied heat to the retort, and when examining the air, which began to come over, by the light of a candle, the appartus burst with a violent explosion.

Spirit of nitrous ether, when thus obtained, is colourless, of a fragrant smell, lighter than water, extremely volatile and inflammable, and possessed of properties very analogous to the *spirit of sulphuric ether*, but of much greater specific gravity, striking a deep olive, with a solution of green sulphate of iron, and almost always acid. Age and exposure to the air, gradually decomposes it, and gives rise to the re-production of more nitrous acid. When this change has taken place, it may be rectified by saturating the acid with lime-water, and redistilling the ethereal fluid. In all probability it is a mixture of nitrous ether and alcohol; for by diminishing the quantity of alcohol employed, we obtain a fluid having a similar relation to the spirit of nitrous ether, that sulpuric ether has to the spirit of sulphuric ether; and we procure, on mixing nitrous ether with alcohol, a fluid exactly resembling the spirit of nitrous ether, and possessing similar properties. In mixing alcohol with the nitrous acid necessary for obtaining nitrous ether, the utmost care must be taken to diminish their action on each other. Dr. Black, to render their mixture extremely slow, on two ounces of the strong acid poured gradually about an equal quantity of water, which, by being made to trickle down the sides of the phial, floated on the surface of the acid without mixing with it. He then added, in the same cautious manner, three ounces of alcohol, which, in its turn, floated on the surface of the water. By this means the three fluids were kept separate on account of their different specific gravities, and a stratum of water was interposed between the acid and the spirit. The phial containing the spirit must be afterwards stopped with a conical stopper, and this stopper confined by a weak spring. If the phial be now set in a cool place, the acid will gradually ascend, and the spirit descend, through the water, this last acting as a boundary to restrain their action on each other. Bubbles of gas will begin to rise through the fluids, and the acid will get a blue colour, which it again loses in the course of a few days, at which time a yellow nitrous ether begins to swim on the surface. As soon as the formation of air-bubbles ceases, it is time to remove the ether formed; for, if allowed to remain, its quantity decreases. By this method a quantity of nitrous ether is formed, without any danger to the operator.

Mr. Dehne added the acid to the alcohol in small quantities, and at considerable intervals, and by this means procured from two pounds of alcohol, and one pound ten ounces and three drachms of nitrous acid, one pound nine ounces and three drachms of ether. In this case, the residuum weighing one pound twelve ounces, there was a loss of five ounces. He put the alcohol into a tubulated retort, to which a receiver was luted, and poured in the acid, and the ether passed over into the receiver, without the application of any heat. The action of the acid on the alcohol did not begin until six ounces and a half were added, and was exhausted, when, on adding more acid, it fell to the bottom in the form of green drops. By using the like precaution, Dr. A. Duncan procured some nitrous ether, in a Woulfe's apparatus, with perfect safety, though Fourcroy represents it as a dangerous operation.

Another method of forming nitrous ether, said

to excel those abovementioned, has been practised by M. Voigt. Four pounds of dried nitrate of potass being first introduced into a tubulated retort, connected with a Woulfe's apparatus, a mixture of four pounds of sulphuric acid, and three pounds four ounces of alcohol, is poured upon it. Without the application of any external heat, nitrous ether passes over, and the residuum furnishes, on the addition of more alcohol, a farther quantity of spirit of nitrous ether.

When by nitrous acid alcohol is converted into ether, the change it undergoes is nearly that occasioned by sulphuric acid. In the latter case, it is effected by the affinities which form water, and charcoal is precipitated; in the former, the affinities which form carbonic acid take place, and there is no water produced.

The difference between nitrous and sulphuric ether seems to consist only in the former being combined with nitric oxide. It is highly inflammable at least; pungent, volatile, and is not soluble in water, while it gives a deep olive colour to vitriolated iron, and has a considerable specific gravity. After simple washing in water, Dr. Duncan found it 0.912. When the acid was removed by saturation with potass, it became 0.896, and when rectified, by re-distillation, it became 0.866, but recovered acid properties, as he supposes, from the nitric oxide being acidified by the air of the apparatus.

With regard to its *medical uses*, the spirit of nitrous ether has long been in great esteem for its property of quenching thirst, promoting secretions, expelling flatulence, and strengthening the stomach. It is given in the dose of about a drachm. Mixed with spiritus ammoniæ aromaticus, in suitable proportions, it proves a good diaphoretic, and often acts remarkably as a diuretic. This spirit added to malt spirits, is thought to give the flavour of French brandy to the latter.

ÆTHIOPS, a name formerly given to several different remedies in powder, on account of their being of a black colour. That heretofore known by the name of *Æthiops* mineral, is now called by the London College, *Hydrargyrus cum sulphure;* by the Edinburgh, *Sulphuretum Hydrargyri nigrum;* and by that of Dublin, *Hydrargyrum sulphuratum nigrum.* See Hydrargyrus. An antimonial medicine once in great repute, and still employed by some practitioners, is the

Æthiops Antimonialis.

Flux equal parts of antimony and sea-salt in a crucible, and knock off the scoria, then rub equal parts of the regulus made in this manner, and mercury together, till they are incorporated.

In cutaneous diseases, glandular obstructions, and many chronic diseases, it is worth a trial; a few grains to be given at first, and the quantity increased as the stomach can bear it. Malouin, in his chemistry, gives various processes for uniting antimony with mercury, some of which are more speedy, and others more perfect in forming this combination.

Dr. Huxham gives the following receipt for his *æthiops antimonialis:*

Take of Quicksilver, four ounces;
Crude antimony, three ounces;
Flowers of sulphur, two ounces.

Rub them together in a marble mortar till the quicksilver disappears, and all the ingredients are thoroughly united.

A preparation of iron, formerly in repute, was, the *martial æthiops;* but it is now neglected.

Æthiops Martialis.

Put filings of steel into an unglazed earthen vessel, with water enough to rise four inches above the filings; the whole is to be stirred every day, and more water supplied, as that in the vessel exhales, so that the filings remain always covered. Continue this process till they are reduced to a powder of an inky blackness.

ÆTHUSA MEUM; the systematic name for the herb *meum athamanticum.* See Meum.

ÆTIOLOGY, (αιτιολογια; from αιτιο, a cause, and λογος, a discourse); the doctrine of the causes of diseases.

AFFECTION, *(affectio,* from *afficio, to affect).* This is expressed in Greek by παθος, hence *pathema, passio.* This term indicates any existing disorder of the whole body, or a part of it, as in the hysterics, cholic, &c. Thus, by adding a descriptive epithet to the term *affection,* most distempers may be expressed. We say *febrile affection, cutaneous affection,* &c. using the word *affection* synonimously with *disease.*

AFFINITY, *(affinitas)*; chemical or elective attraction. It is a term used by chemists to denote the continual tendency to bring principles together, which are disunited; and to retain with more or lesss energy, those which are already in combination.

It is impossible to enter upon the study of nature, without taking notice of that wonderful mutual force by which all natural bodies are attracted towards each other. On this great and universal law, all those phenomena depend which the philosopher contemplates with curiosity, and which the most ignorant cannot behold without admiration. This force actuates the most minute bodies as well as the most enormous masses of matter. But it acts by laws, either essentially different, or at least differently modified, according to the mass, consistency, and distances, of the bodies subject to its influence.

Natural philosophy has taught us, that, when two solid bodies of the same kind come into contact, they adhere together with a degree of force

proportioned to the extent and smoothness of the surfaces in union. Thus, two panes of glass, or two sections of a metal sphere, if pressed together, unite with a degree of tenacity which renders a considerable effort necessary to separate them. This force produces all the phenomena observed in chemistry. It becomes, therefore, an object of the highest importance to study all its laws, and inquire what variations it undergoes from diversity of circumstances. The greater part of chemists have denominated this force *affinity* or *relation;* because it has been thought to depend on an analogy or conformity of principles in the bodies between which it subsists. Bergman has given it the name of *chemical attraction;* and, though its phenomena are different from those of the planetary attraction first observed by Newton, yet, as both probably depend upon the same principle, we may follow Bergman in the use of the name. Chemical attraction may take place between bodies of the same nature, or between bodies of different natures. Two general kinds of affinity may therefore be distinguished, with respect to the nature of bodies. 1. The affinity of aggregation, or that which exists between two principles of the same nature. 2. The affinity of composition, or that which retains two or more principles of different natures in a state of combination. There are, besides, peculiar affinities to be hereafter described.

Ingenious tabular methods have been invented, in order to exhibit at once all the more regular phenomena of chemical decomposition. Useful attempts have been made in this way by Geoffrey, Rouelle, Sage, Gellert, and particularly by professor Bergman. See Elective Attraction.

AFFINITY of AGGREGATION. This takes place between bodies of the same kind. It is that power by which homogeneous bodies have a natural tendency to remain in contact until they be separated by the action of some superior force: thus when two bodies of the same nature, for instance two globules of mercury, placed at a certain distance from each other, tend, by virtue of this force, to unite, and do actually enter into union, that they must form a sphere greater in bulk, but precisely the same in nature. In that event, therefore, this force affects only the physical, or obviously apparent qualities of bodies; it joins separate portions of similar matter, by confounding together several distinct masses; it forms a body of greater bulk, and unites a number of separate parts into one *whole.* It is denominated the *attraction,* or *affinity of aggregation,* in order to distinguish it from that which takes place between bodies of different natures. It produces an aggregate in which the physical qualities of the bodies united undergo a new modification, without any sensible change being produced in their chemical qualities. The *aggregate* is nothing more than a coherent body, the parts of which are retained in union by the force of aggregation. It must be distinguished from the mass called an *heap;* for though an heap consist of parts all of a similar nature, yet those parts are disposed loosely, and without coherence. It is likewise to be distinguished from a *mixture;* which consists of a quantity of dissimilar particles blended together without adherence. This may be further explained by a familiar example: flowers of sulphur, or sulphur in powder, whose parts have no adhesion, and may be separated by the slightest effort, compose an heap, the parts of which are not affected by the affinity of aggregation. This mixed with another heap, with one, for instance, consisting of nitre in powder, gives what is called *a mixture by confusion.* But if, by the help of fusion and cooling, you subject this heap to the power of aggregation, the molecules or integral parts of the sulphur will then be drawn towards each other during its liquefaction, and will mix and unite in such a manner as to form, when cooled, an uniform mass or solid, which will be a true aggregate.

The affinity of aggregation is stronger, the nearer the integrant parts approach to each other; so that every thing which tends to separate or remove these integrant parts from each other, diminishes their affinity, and weakens their force of cohesion. Heat produces this effect upon most known bodies, and it is from this circumstance that metals have no consistence.

The force or affinity of aggregation also exists in various degrees, which are measurable by the effort necessary to separate the integrant parts of any aggregate body. Aggregates may therefore be distinguished into four kinds, under which all the bodies in nature may be arranged.

1. The hard or solid aggregate, in which the integrant parts are united by a very considerable force, and cannot be separated without great exertion. In this genus many species or degrees are comprehended; from the hardness of the precious stones and of rock-crystal, to the yielding contexture of the softest wood. Its peculiar characteristic is to form a mass, the constituent parts of which cannot suffer any discernible motion without being divided. 2. Bodies, the constituent parts of which may be easily moved backwards and forwards, so as to change their relative situation without being separated, belong to the soft aggregate. Less force is requisite to maintain the cohesion of a soft body than to preserve the consistency of a solid aggregate; and less re-action to destroy it. 3. The integrant parts of the fluid aggregate are so slightly united, that the gentlest effort is sufficient not only to change their relative situation, but even to divide them into distinct globules. 4. In the aëriform aggregate, the smallness of the integrant particles renders them imperceptible, and the affinity of aggregation is the least possible. The air of the

atmosphere affords an example of this kind. But these four kinds of aggregate are, properly speaking, only different degrees of the same force: it is, however, absolutely necessary to distinguish accurately between them; because they have an important influence on the operations and phenomena of chemistry, which is diversified according to their differences. It may be proved in the most satisfactory manner, that they are only so many different degrees of the same force; for many bodies are capable of assuming each of these four states successively. Water, in the form of ice, is a solid aggregate; its hardness is greater in proportion as its temperature is lower; when exposed to the temperature of 32 degrees Fahrenheit, it assumes a kind of softness before passing into a fluid state. Its existence in this last state is universally known: and philosophers have calculated what degree of expansive force is necessary to reduce it to vapour; in which state it becomes an aëriform aggregate.

In order to destroy or weaken the affinity of aggregation, all that is necessary is, to oppose to the cohesion of the aggregate an external force more than sufficient to counterbalance that which preserves the union of its component parts; the external force applied must therefore be proportioned to the adhesion of the parts. This law must always be observed in the preparatory operations; the purpose of which is to destroy the affinity of aggregation.

Art, which can apply a variety of means to counteract, and even destroy the force of aggregation, can also afford others to restore it, and cause it to act with all its former energy. All the manipulations which it employs for this purpose, consist in placing the bodies, whose force of aggregation is to be restored, in such a state of division and fluidity, that their particles may be at liberty to obey the power of attraction, by applying to each other those of their surfaces which are best adapted to unite; and they thus form a new aggregate, which, in regularity of figure and cohesive force, is generally equal, and sometimes superior, to natural aggregates of the same kind. All substances capable of passing through the several states of aggregation above enumerated, but more especially salts and metals, may be so managed during the process by which they are reduced from a fluid to a solid state, as to assume the form either of an irregular mass, or of a body with regular lines, angles, and surfaces, which is called a crystal. The first form is obtained by keeping the particles of the fluid body, whether its fluidity may have been occasioned by fire or water, very near each other; and causing the liquefaction to cease suddenly, so that they may come into contact all at once, and the affinity of aggregation may cause them to unite into one irregular mass. But, on the contrary, to produce crystallization, it is necessary to keep the parts of the body which you wish to bring into that state, at as great a distance as possible from one another, that they may remain for some time in a kind of equilibrium, before coming into union, and may present to each other such of their surfaces as are best adapted to unite. From this it appears, that crystallization is owing to the affinity of aggregation; and if the phenomena of crystallization be observed with a proper degree of attention, they will afford an idea of the manner in which the affinity of aggregation acts. See CRYSTALLIZATION.

AFFINITY OF COMPOSITION; that power by virtue of which bodies of different natures unite and form new combinations. It is generally known, that bodies of different kinds exert a force or attraction upon each other, which is more or less strong; and that it is by virtue of this force that all the changes of composition or decomposition observed amongst them, are effected. The affinity of composition exhibits invariable laws in all the phenomena it causes; consequently these laws may be stated as general principles, to which may be referred all the effects presented to our observation by the action of bodies upon each other.

1. *The attraction, or affinity of composition, cannot act but between bodies of different natures.* This law is invariable, and admits of no exceptions. That two bodies may combine, and form a compound, it is indispensably necessary for them to be different in kind. Join two bodies of the same nature, and you form only an aggregate, of which the bulk and extent are enlarged, but its essential properties remain unaltered; and their union is occasioned and preserved by the affinity of aggregation, conformably to the explanation already given of the nature of that affinity. For instance, two pieces of wax, rosin, or sulphur, may be united by the action of heat; and this is sufficient to explain the difference between aggregation and composition. This law holds so invariably, that the attraction of composition is never stronger than when the bodies between which it acts are, in nature, the most essentially different from one another. Thus acid salts and alkalis, though the properties of the one be directly opposite to those of the other, enter into the most intimate mutual combination, and form the most perfect compound. The same opposition subsists between the properties of alkalis and sulphur, of acid salts and oil, of acids and metals, of water and spirit of wine, &c.; but all these substances have a strong tendency to mutual union.

2. *The attraction of composition only acts between the minutest particles of bodies.*—To form a just idea of the nature of this law, it is necessary to distinguish chemical from physical subjects. These last are bodies whose external qualities, such as weight, bulk, surface, extent, and figure, are perceptible to our senses, and may be estimated by their effects upon them. Aggregates are the bodies

whose qualities are observed and compared by the naturalist. Further, chemical subjects are substances which have lost their aggregation; and which, of consequence, no longer present to the senses the physical properties of aggregates. They are minute particles, the extent of which cannot be measured, nor their bulk or form distinguished. It is not till after bodies have been reduced to this state of tenuity by the several preparatory operations which have been mentioned, that they become subject to the affinity of composition; and the chemist cannot cause them to enter into combination, without presenting them to one another in a state of division. This force seems to actuate none but the minutest particles of bodies: and in this manner does the attraction of composition appear to differ from that which acts between large masses of matter. The difference is still more striking when we consider the constant opposition between the attraction of aggregation and that of composition. This opposition is so invariable, that we may even venture to advance it as a chemical axiom, that the attraction of combination is in the inverse ratio of that of aggregation; these two forces being always in opposition, and forming a kind of counterpoise to each other. The attraction of aggregation always resists the combination of different bodies: where it acts with the greatest force, they have scarce any tendency to mutual union; and again, such substances as are least under the influence of the force of aggregation, have a strong tendency to combine with others. The various kinds of *gas*, or air, for instance, of all known substances are least under the influence of the force of aggregation; and of them there are many whose tendency to combination is so strong, that they combine with the greatest facility with almost any natural body. This happens, however, only when the heat which enters into the composition of elastic fluids is but slightly combined with a base; and the aëriform state often occasions a contrary tendency; as for instance, in oxigen.

3. *The attraction of composition can unite more bodies than two.*—This law of chemical attraction has been established by the fewest observations, and is still but imperfectly understood. A vast variety of this kind of combinations are known which are produced by the union of two bodies, and a few which are formed by the union of three bodies; but we know of scarce any instances in which four different bodies have an equal tendency to enter into mutual combination, and remain in that state. Metals are the only bodies that are known to be capable of this last species of combination; and of which two, three, or four, may be effectually blended together. It is, however, highly probable that there are in nature combinations made up of more than four bodies, of six, or eight, for instance, but they are unknown to the chemist. The number of the substances of which any composition consists, is denoted by saying, the affinity of one, two, three, or four bodies, and so on.

4. *For the affinity of composition to take place between two bodies; at least one of them must be in a fluid state.*—This law has been long known, and expressed in this axiom, *Corpora non agunt, nisi sint soluta.* Uniform and accurate observation has shown, that two solid substances can never enter into mutual combination. Even bodies which have the strongest tendency to unite, cannot be brought into union till either the one or the other of them be reduced to a fluid aggregate. Bodies enter into combination with more or less facility, according as they are more or less in a state of fluidity, and consequently possess more or less aggregate force: and therefore no two bodies enter into combination with such rapidity as two of the saline aeriform fluids; for instance, the muriatic acid gas and the alkaline gas. But notwithstanding two solid bodies cannot enter into combination with each other; in some instances dry substances, reduced into a fine powder, re-act upon each other with so much energy, as to unite and form a new compound. Mr. Fourcroy has discovered that caustic fixed alkali, when reduced by trituration, unites in a cold dry state with sulphur and antimony; but in this instance, the reduction of the bodies into their most minute particles by pulverization, and the moisture of the atmosphere attracted by the salt, which soon deliquiates, have a considerable share in effecting the combination, and consequently bring this phenomenon under the present head.

It is not, however, always necessary that the bodies which are to combine be both fluids; it is sufficient that one of them be in that state. When they unite, a phenomenon takes place, to which chemists have given the name of *solution.* It consists in the attenuation, division, and entire destruction of the solid body in contact with the fluid. The cause of this phenomenon is, that the attraction of combination between two substances, one of which is a liquid, the other a solid, such as the sulphureous acid and a bit of calcareous spar, is stronger than the aggregative force which preserves the particles of the solid in exclusive union with one another. Since it is clear by the third law, that this species of attraction cannot act but on the most minute particles of bodies, the spar must necessarily lose its aggregation, and be reduced into very small particles, in order that it may combine with the *sulphuric* acid, and form *sulphate of lime.* Formerly, chemists always distinguished between the body which effected and that which suffered the act of solution: the former was the fluid, the latter the solid. But modern chemists refuse to admit this distinction, as it sup-

poses a force in the fluid superior to what exists in the solid aggregate. Mr. Gellert has observed that the two bodies contribute equally to the act of solution; and that in the above instance, the vitriolic acid could not destroy the aggregation of the spar, had not the spar a tendency to unite with the sulphuric acid no less strong than that of the acid to combine with it. The name *solvent*, therefore, given at present to fluids, is not strictly chemical, as it conveys only the idea of a mechanical operation; but since it has been improperly introduced, the student must always remember, that when one body is said to dissolve another, no more is meant than that the former is in a fluid state, and that the fluid can never possess greater activity or energy than the solid; but the solid may rather be considered as possessing these qualities in a superior degree, since its tendency to combination is so powerful as to overcome its force of aggregation.

This inaccurate notion of solution, which has prevailed till of late, probably arose from the mechanical theory by which some chemists have sought to explain that operation of nature. See SOLUTION.

5. *When two or more bodies are combined by this affinity, their temperature suffers a change at the instant of their union.*—All the combinations effected by art, are so constantly attended by this phenomenon, that it may be considered as one of the laws of the attraction of composition. The temperature of bodies may be altered in two ways, as new combinations sometimes produce cold, sometimes heat, but the latter more frequently than the former.

6. *Two or more bodies, united by the attraction of composition, form a substance, the properties of which are different from those which each of the bodies possessed before their union.*—All that is necessary to prove the existence of this law, is to produce some instances in which the properties of compounds are totally different from those of either of their principles; and the phenomena of all chemical combinations come under this description. But, in order to show that bodies which enter into combination lose their original properties; and that they acquire new properties totally different from those that they before possessed, it may be necessary to point out some properties of which the variations may be easily distinguished. Taste is very often a very eminent property in two distinct bodies, which when united are almost insipid in comparison with what they were in that respect before. *Sulphate of pot-ash*, or vitriolated tartar, which is produced by the combination of two potent caustics, the sulphuric, or vitriolic acid, and pure *pot-ash*, has only a bitter taste; which is by no means an intermediate between the caustic poignancies of those two salts. Two bodies with little or no taste, also frequently acquire by combination a very strong taste; a few grains of the *oxigenated muriatic acid*, or a few grains of mercury given in a glass of water, can produce no bad effects on the animal œconomy; whereas, if combined so as to form the *oxigenated mercurial muriate*, or corrosive sublimate, and administered in the same manner, they have a most pungent taste, and produce the most fatal effects on the human constitution. Bodies entering into combination are also liable to a change of form. Two substances, neither of which is by itself susceptible of crystallization, often assume a regular form when combined: thus the *muriatic acid gas*, and *ammoniac* or alkaline gas, when they enter into combination, form crystals of *muriate of ammoniac*. In other instances, the form suffers only a light change of modification; as in the combination of certain neutral salts, in the union of sulphur with metals, and in alloyed metals; which last have been observed by M. l'Abbe Mongez to afford crystals somewhat different from those of pure metals. Bodies that are, in a simple state, highly susceptible of crystallization, lose that property when combined with other bodies. This happens to all metals when united with the *oxigenous* principle; and to some of them when combined with acids. The consistency of bodies is also affected by their combination; the consistency of a compound being almost always different from that of either of the simple bodies of which it is composed. Thus, two fluids often produce a solid by their combination; for instance, the sulphuric acid united with a solution of pot-ash. And a fluid often results from the combination of two solids; as from a combination of neutral salts with ice, and from the mixture of an amalgam of lead with an amalgam of bismuth. But the quality which suffers the most frequent alterations in the combination of bodies is colour. Sometimes it is lost: thus the coloured muriatic acid, combined with a metal, becomes white. It oftener happens, also, that two bodies destitute of colour assume when united either a fainter or stronger colour, as when iron or copper are dissolved in almost any of the acids, and when the oxides or calces of lead, mercury, or almost any other metal, are united with the oxigenous principle.

Various bodies likewise, which, in a simple state, are strongly odoriferous, become inodorous when brought into combination; as for instance, the muriatic acid gas and the ammoniac or alkaline gas, which, in a simple state, have a strong suffocating smell, form, in combination the muriate of ammoniac, a neutral salt which has scarcely any smell. From the union of two inodorous bodies, there also frequently results a strong-smelling compound: sulphur and fixed alkali, each of which is, in a simple state, almost destitute of smell, form, when united, liver of sulphur, or *sulphure*, a sub-

stance which, in a moist state, is extremely fetid. The fusibility of bodies is subject to the same alterations. Two substances, not susceptible of fusion, or which cannot be reduced to that state without the greatest difficulty, when combined acquire the property of fusibility in an high degree. The combination of sulphur with any of the metals, forms a striking instance of the truth of this assertion. A variety of other facts also concur to establish this law.

7. *The attraction of composition is measurable by the difficulty of destroying the combination formed between two or more bodies.*—Chemists know how to separate bodies in union, however strong their mutual attraction or adherence: but the means which they employ are more or less easy, or more or less complicated. It has been constantly observed, that in proportion as a compound is more or less perfect, its component parts are separated with more or less difficulty; and the degrees of the difficulty with which any two substances are separated, may be considered as in direct proportion to the degrees of the attraction by which they mutually adhere; the one will afford a just estimate of the other.

It is particularly necessary to insist on this law, as it is easy to fall into mistakes in estimating the differences of the attraction which unites the principles of different combinations. From the rapidity with which some substances combine, it is natural to imagine that their mutual attraction must be very considerable. But experience shows that this eagerness to enter into combination, instead of indicating a perfect composition, is rather a proof that the attraction between the bodies is extremely weak, and can produce but a very imperfect compound. In order, therefore, to determine accurately the degree of affinity with which bodies unite and remain in union, it will be proper to consider the ease or difficulty with which they are separated.

8. *Bodies have not all the same degree of chemical attraction with regard to one another; but the degrees of that force subsisting between different bodies may be determined by observation.*—There is not uniformly the same tendency to mutual combination in natural bodies. There are even some bodies which absolutely refuse to unite, or between which at least art cannot effect a direct combination; such as iron and mercury, water and oil, &c. yet it is not true that these bodies have no mutual attraction. Others require long time and much pains to bring them into combination. But the most important circumstance of this variety of chemical attraction is, that as various bodies are united with various degrees of force, it is possible to attain such an accurate knowledge of the particular degree of force that unites any two bodies, as to effect a separation between them at pleasure. This decomposition is the grandest effect of the chemical art: by it the chemist is frequently able to perform what appears extraordinary to those unacquainted with the principles on which he proceeds. To comprehend the nature of this decomposition, suppose two bodies to be united with a force equal to four; as for instance, an acid and an *oxide*, or metallic calx; and let a third body, such as an alkali, which has an affinity with the acid equal to five or six, be brought into contact with this compound; the consequence will then be, that the alkali, whose tendency to combine with the acid is greater than that of the acid to remain in union with the metallic *oxide*, will desert the latter in order to combine with the former. This is precisely the result of such a mixture: the metallic *oxide*, appears in a separate state, and a new combination is formed, consisting of the acid and the alkali. This decomposition is commonly known by the name of *precipitation;* as the substance separated generally falls to the bottom of the fluid compound. See Precipitation.

AFFINITY, COMPOUND. When three or more bodies, on account of their mutual affinity, unite and form one homogeneous body, then the affinity is termed compound affinity or attraction: thus, if, to a solution of sugar in water, be added spirits of wine, these three bodies will form an homogeneous liquid by compound affinity.

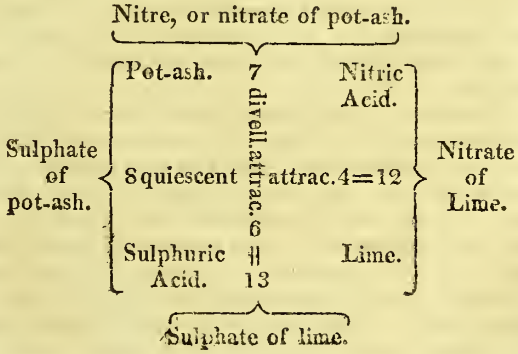
AFFINITY, DOUBLE, *or* double elective attraction. It is not difficult to understand the theory of the decomposition of compounds of two bodies by means of a third, brought into contact with them. These all depend upon simple elective attractions. But greater difficulty will be found in acquiring a distinct idea of that complicated phenomenon to which chemists have given the name of *double elective attraction.* It frequently happens that a compound of two bodies cannot be destroyed by a third or fourth body individually; while, if a compound of the two last be brought into contact with the first compound, both compounds are instantly decomposed. An example will render this more familiar: Sulphate of pot-ash, or a combination of the sulphuric acid with pot-ash, cannot be decomposed by either quick lime or the cold nitric acid individually; but pour into a solution of the former neutral salt, a proper quantity of the *nitrate of lime*, formed by the union of the nitric acid with quicklime, the two combinations will be mutually decomposed; the nitric acid uniting with the pot-ash to form common nitre, while the sulphuric acid uniting with the lime forms sulphate of lime; which being less liable to solution than the nitre, is therefore precipitated. This affinity may probably appear strange and unaccountable; but it may be explained in the following manner: The sulphuric acid cannot be separated from pot-ash, either by lime or by the nitric acid, because it has

a stronger affinity with that alkaline substance than either of the two latter bodies has with it or with the alkali. But when you present to the sulphate of pot-ash a compound of the nitric acid with lime, the nitric acid immediately exerts its tendency to combine with the pot-ash, while the sulphuric acid is at the same time attracted by the lime; so that the decomposition of the sulphate of pot-ash is begun by the action of the nitric acid, and completed by that of the lime. To explain this double affinity still more clearly, suppose the force of adhesion, which unites the sulphuric acid with pot-ash, to be equal to eight; the nitric acid tending to unite with that alkaline substance with a less degree of force, which may be estimated at seven, would be insufficient of itself to decompose the sulphate of pot-ash; but the lime, by its tendency to combine with the sulphuric acid, aids it with a force which we may consider as equal to six; and these two forces together amount to thirteen; which sum of forces is exerted against eight, to separate the sulphuric acid from the pot-ash. This compound force will also be greater than that by which the union between the lime and the nitric acid is maintained.

Double elective attractions have but of late years been taken notice of by chemists, and they are far from being all known. Those who are engaged in chemical researches, will frequently find this kind of decomposition in circumstances where no such phenomenon was before suspected to take place. In some instances, those laws which affect the phenomena of chemical attraction, are liable to certain variations, which seem to arise from the influence of particular circumstances; such as the quantity of the substances, the temperature of the atmosphere, motion or rest, solution by water or fire, that is, in the *humid* or in the *moist* way, the state of aggregation proper to each body, &c. Bergman has considered all these circumstances with peculiar care; and has shown how far they may be expected to vary the laws of attraction. From the various facts which he has collected relative to this subject, he concludes, that these variations can be regarded only as exceptions, by no means sufficient to weaken the evidence on which the doctrine of chemical attraction is grounded.

AFFINITY, INTERMEDIATE, or APPROPRIATE AFFINITY. By this is understood that attraction, by which bodies, that have no natural tendency to mutual union, are capable of being united after one of them has been combined with a third body, which serves as an intermediate between them: oil, for instance, does not combine with water; but a combination of oil with a salt constitutes a soap, which is soluble in water, the salt acting as an intermediate. But it is not the salt which renders the soap soluble, for its properties are entirely lost in the soap; the solubility of this compound in water is owing to the new properties it has acquired. This phenomenon falls evidently under the eighth law of chemical attraction; by which it is established, that compounds acquire new properties totally different from those of their component principles.

AFFINITY, QUIESCENT AND DIVELLENT. There are two kinds of attraction in double elective attractions, which must be accurately distinguished from each other; the first is that by virtue of which the principles of each of the two compounds adhere to one another, which, in the instance stated under the article DOUBLE AFFINITY, retains the sulphuric acid in union with the pot-ash, and causes the nitric acid to adhere to the lime. Mr. Kirwan has given to this force the name of *quiescent attraction;* because its tendency is to preserve the two compounds in their first state. The second is that by which the four principles of the two compounds reciprocally change their situations, and are combined in a different order. It is by virtue of this affinity, that in the above instance, the pot-ash combines with the nitric, and the lime with the sulphuric acid. This second force may be denominated *divellent attraction;* because it counteracts and destroys the first. From this useful distinction, it becomes easy to explain the cause of this double decomposition, by exhibiting in a table, as Bergman has done, the forces of the attractions by which it is produced. Place the two compounds which mutually decompose one another between two braces directly opposite, the acids standing in opposition to the bases on which they act. Between these four bodies note down the particular degrees of the attractive force which they exert upon each other; then add together the two horizontal numbers, expressing the quiescent attractions; and also the vertical numbers which are employed to mark the divellent attractions. If the sum of the latter exceed that of the former, a double decomposition and a double combination will be effected. An example of this from the last mentioned compounds, will afford a sufficient explanation :—



AFFINITY, RECIPROCAL, is when a compound of two bodies is decomposed by a third; the separated principle being in its turn capable of decomposing the new combination, so that the principles seem to act reciprocally. The sulphuric acid has a greater affinity than the nitric acid with pot-ash, and accordingly decomposes a combination of these two principles; but, the nitric acid, when left in a separate state, has power to divide the sulphuric acid from the alkali; for by heating sulphate of pot-ash with the nitric acid, nitre is again obtained. This kind of affinity is occasioned by two circumstances, the influence of which disturbs the general laws of chemical affinity. The common nitric acid must be warmed before it can decompose sulphate of pot-ash; and the nitre obtained by this process is again decomposed by the sulphuric acid, as soon as the mixture returns to a cold state.

AFFINITY, SIMPLE, otherwise called *single elective Attraction.* See ELECTIVE ATTRACTION.

AFFLATUS, a term importing *vapour* or *blast.* A species of erysipelas, which attacks suddenly, has been thus named by visionary persons, on a vague supposition, that it is produced by some unwholesome wind blowing upon the part.

AGALACTIA (*αγαλακτια*; from *α*, priv. and *γαλα*, milk); the defective secretion of milk in child-bed.

AGALACTOS (*Αγαλακτος*; from *α*, priv. and *γαλα*, milk); an epithet given to a woman who has no milk for her offspring.

AGALLOCHUM. See LIGNUM ALOES.

AGARIC. See AGARICUS.

AGARICOIDES, (from *αγαρικον*, and *ειδος*, *form*), a sort of fungus, like agaric.

AGARICUS QUERCUS; *Agaric of the oak; Touchwood boletus.* This fungus, which is the *Boletus igniarius; acaulis pulvinatis levis, poris tenuissimis* of Linnæus, has been much used by surgeons as an external styptic. It grows in the form of a horse's hoof; externally it is of a dusky ash-colour, and internally of a dusky red; it is soft and tough. The best is said to grow on the larger branches of oak trees; but that which is found on other trees, is generally as good. Though still employed on the continent, the surgeons in this country have not much confidence in this remedy.

It consists of four parts, which present themselves successively. 1st. The outward rind, which may be thrown away. 2d. The part immediately under this rind, which is the best of all, to restrain hæmorrhages from wounds; for that purpose, it should be beaten well with a hammer until it is soft and pliable. Slices of it of a proper size are then applied upon the open blood vessel, whose discharge it restrains, not from its restringency, but its texture and adhesive quality, in which it resembles common sponge. On the first application it adheres pretty strongly, but before the end of two days it begins to separate and soon falls off. 3rd. A part which adheres to the second, and which being an inferior sort, is used in less important cases. The 4th, or last part, may be powdered, and then used for the same purposes as the second and third sorts. The best time for taking this fungous substance from the trees is in autumn.

AGA'RICUS ALBUS. The plant known by this name in the pharmacopœias, is the *Boletus laricis* Linn. Several preparations, as troches, an extract, and pills, are ordered to be made with it in foreign pharmacopœias, and are administered in consumptive complaints.

It grows on the trunks of larch trees, and also on some others, without any pedicle. Internally it is white, and of an uniform structure; outwardly it is covered with a brown bark, full of small holes underneath. In autumn this substance is cut off from the trees, separated from its bark, then exposed to the sun, which both dries it, and increases its whiteness. The lightest, whitest, and most free from gritty matter, is the best. It has but little smell. When chewed it is at first sweet, then bitter. It gives out its active parts to watery menstrua, and also to spirituous. It is with difficulty reduced to powder, except it be first moistened with a solution of gum arabic, and afterwards thoroughly dried. It is cathartic, but hardly ever used in our practice, as its operation is both slow and unpleasant, occasioning sickness, gripes, &c. The dose is from ℈i. to ℈ij.

AGA'RICUS PIPERA'TUS. The plant thus named by Linnæus is the *Pepper Mushroom*, also called *Pepper Agaric.* It is the *fungus piperatus albus, lacteo succo turgens* of Ray. *Fungus albus acris.* The stalk is about two inches high. The hat is convex when young: as it expands, it becomes nearly flat; its colour is a dirty white, with a mixture of grey; it contains a milky juice. The disk is constantly bent inwards: when the fungus is decaying, the hat becomes bent in its centre, and is sometimes seen funnel-shaped. The lamellæ are close, numerous, and of a pale flesh colour.

It is very common in woods, near the roots of trees. When freely taken, fatal consequences are related, by several writers, to have been the result. When this vegetable has even lost its acrid juice by drying, its caustic quality still remains. On the subject of injury from any of the mushroom tribe, see the article AMANITA.

AGA'RICUS MUSCARIUS. This is a reddish fungus; the *Agaricus muscarius; stipitatus, lamellis dimidiatis solitariis, stipite volvato apice dilatato basi ovato* of Linnæus. It is one of the poisonous vegetables that are indigenous in Great Britain. The pillar stalk is white, thick, and hollow; thicker towards the top; egg-shaped at its base;

surrounded at its middle with a pendulous membrane, and furnished with a cap which is large, sometimes six inches or more in diameter; almost flat; either white, red, or crimson colour; and sometimes beset with angular, downy, white, or red warts. The gills are white, flat, and inversely spear-shaped; the greater number extend from the rim of the cap to the stalk, the rest only half way. When this mushroom is decaying, the gills become brownish. It is found in pastures and woods.

If the juice of this *mushroom* be rubbed where bugs retreat in the day, it will destroy them; hence it has obtained the vulgar name of *bug Agaric.* Infused in milk, it is destructive to flies the instant they sip it. Haller relates, that six persons of Lithuania perished at one time by eating this kind of mushroom; and that in others it has caused delirium. Two or three may be taken without mischief; but more will be dangerous.

AGE. The ancients reckoned six stages of life; viz. *pueritia*, childhood, which is to the fifth year of our *age*;—*adolescentia*, youth, reckoned to the eighteenth, and youth, properly so called, to the twenty-fifth year;—*juventus*, reckoned from the twenty-fifth to the thirty-fifth year; —*virilis œtas*, manhood, from the thirty-fifth to the fiftieth year;—*senectus*, old *age*, from fifty to sixty, —*crepita œtas*, decrepid age, which ends in death. These periods, however, may be reduced to four, to wit, Infancy, Youth, Manhood, and Old Age.

1. In *Infancy* Dr. Cullen says there occur remarkable lax solids, a large proportion of fluids which are watery and bland, a large proportion of blood in respect to cellular substances. The head and heart too are large in proportion to the system; the arteries numerous and large in respect to the veins; the secretory glands have not yet attained to their full bulk, while the conglobate, or lymphatic, are larger than at any other time of life. In the nervous system there is exquisite sensibility, without accuracy of perception; remarkable irritability with weakness; great mobility, the foundation of a great deal of levity. In general, the nervous system is strong, with respect to the present time of life, but weaker than in a more advanced period.

2. In *Youth*, or that period in which the body is *approaching near to its* Acme, *rigidity* and *strength* are greater, but still, with respect to the middle point, laxity prevails. There is a less proportion of fluids, with respect to the vessels, but still a prevailing humidity; an increase of cellular substance, on which the growth of the body chiefly depends till the Acmé, and long after; the heart less in proportion to the system than formerly, and more in a balance with it; the arteries diminished, in some measure, with respect to the veins, but still exceeding them; the whole viscera large, and particularly the lungs; and, as the vessels are more rigid, consequently there is a greater determination of fluids to that organ, which explains the diseases incident to this stage of life, to wit, hæmoptisis, peripneumony, &c. The same sensibility and irritability continue, perhaps, as before, but the former is more acute, from the tension of the vessels, and consequently of the fibres. The latter is rather increased, and hence irascibility more frequently appears at this period. There is also great mobility, but with much less levity.

3. It is difficult to fix the period of *Manhood*; different persons attaining their Acmé at different times. Dr. Cullen takes the thirty-fifth year for a standard. The solids are then tending to excess of rigidity, with respect to the middle point; the fluids are less in proportion to the solids, whence driness begins to take place; the heart is smaller, with respect to the arteries, and exerts less force than formerly; hence slower circulation, more copious secretion, and obesity, with consequent succulency. Hitherto little change has happened in the state of the fluids, but now they begin to tend towards acrimony. The arteries now become less, and the ballance is turned to the side of the veins. The secretory glands are now increased, while the lymphatic vessels are diminished, as also the conglobate glands. Sensibility, irritibility, mobility, and consequently celerity and levity, gradually diminish from this time. Till this period the strength has been gradually increasing, but is now at its height, and afterwards decays, chiefly on account of the rigidity of every part of the system. In infants the muscles consist of truly muscular fibres, or with very little tendon; but now the tendinous exceed the muscular parts, and in proportion perhaps the force is diminished. This state of manhood is very variable as to its period, happening in some sooner, in others later; but from this to fifty, the changes are less remarkable than at any other state of life.

4. As for *Old Age*, *when* this comes on we cannot say exactly; but when it *does* take place, rigidity is in excess. Driness, proceeding from the small proportion of fluids, both in the circulatory vessels and cellular membrane. Acrimony of the fluids is in excess, *perhaps to compensate for the want of fluidity* in the blood, by diminishing its cohesion. Instead of an *arterious*, a *venous* plethora obtains. The lymphatic system almost disappears. Both from weakness of the nervous power, and rigidity of the simple solids, sensibility, irritability and mobility, formerly so remarkable, are now greatly diminished.

Thus Dr. Cullen distinguished the four grand stages of life, by the changes which are observed to take place in the human system. These different changes he says, do not happen so uniformly, but some peculiarities are remarkable through the

whole of life. Thus each sex is distinguished. In the female, there is great laxity, with humidity and thinness of the fluids, arterious plethora, more sensibility, irritability, levity and weakness; so that in them the character of youth continues longer than in the male. In every period of life there are appearances of a temperament peculiar to the individual, though the Ancients only took notice of four; and though some have imagined that these were deduced from the theories of the four humours, or four cardinal qualities, it is more probable that they were first founded on observation, and afterwards adapted to those theories, since we find that they have a real existence, and are explicable on the established doctrines of medicine.

AGENESIA, (αγενησια; from α, neg. and γινομαι, to *beget)*; impotency in males; a term employed by Vogel. It is synonimous with *anaphrodisia* and *dyspermatismus*, which see.

AGERATUM, (αγηρατον; from α, priv. and γηρας, *senectus*, *never old*, ever-green); *Balsamita fœmina. Eupatorium mezues.* Maudlin Tansey. The ageratum of the pharmacopœias is the *Achillea ageratum foliis lanceolatis*, *obtusis*, *acute serratis* of Linnæus. It is a perennial slender plant, with undivided, indented, narrow leaves, and yellow naked discous flowers, set in umbels on the tops of the stalks. It is a native of the southern part of Europe, and cultivated in our gardens. It flowers in July and August, has an agreeable smell, and a warm bitterish taste. It possesses the virtues of tansey, but is hardly ever used in Britain, though it is esteemed in some foreign countries as an anthelmintic and alterative, and is given in hepatic obstructions.

AGGLUTITIO, an obstruction in the œsophagus, occasioning a difficulty in swallowing.

AGGREGATE GLANDS, *(glandulæ aggregatæ;* from *uggrego*, to assemble together). An assemblage of glands, as those of the intestines.

AGGREGATION, *(aggregatio)*. See the article AFFINITY.

AGHEUS'TIA, OR AGEUS'TIA, (from α neg, and γευνομαι, *gusto)*; a *defect or loss of taste*, called also *Apogeusia*, *Apogeusis*. Dr. Cullen ranks this as a genus of disease, in the classs locales, and order dysæsthesiæ. The causes are fever, or palsy, whence he forms two species; the first he calls ORGANIC, arising from some affection in the membrane of the tongue, by which relishing things, or those which have some taste, are prevented from coming in contact with the nerves: the second ATONIC, arising without any affection of the tongue. SAUVAGES says the cause of this disease is either in the brain, in the tongue itself, or in the passage of the lingual nerves. He forms two species—1. *Febrilis*, where a suppression of taste accompanies ardent and malignant fevers, on account of the extreme driness of the tongue, when it wants moisture, grows black and rough like wood; or from the delirium, or comatous state into which patients sometimes fall.—2. *Paralytica*, when it accompanies a paralysis of the tongue, or some comatous disorder.

AGLACTA'TIO, (from α, non, and γαλα, *lac)* a defect of the milk in lying-in women.

AGLUTI'TIO, (from α priv. and γλυζω, *to swallow)*. See AGGLUTITIO.

A'GNACAL; a tree which grows about the isthmus of Darien: it resembles a pear-tree, both as to its general appearance, and its fruit, the pulp of which is said to be highly provocative of venery.

AGNINA MEMBRANA, vel PELLICULA; a term given by Aetius to what we now call the *amnios.*

AGNOI'A, (from α, neg. and γινωσκω, *to known)*. It is when a patient in a fever forgets his acquaintance. So Hippocrates names this circumstance, and observes that, when it is joined with a rigor, it is a dangerous symptom.

AGNUS CASTUS, (from αγνος, a lamb); so called from the down upon its surface, which resembles that upon a lamb's skin; and *castus*, because the chaste matrons, at the feasts of Ceres, strewed them upon their beds, and lay upon them). The plant bearing this name in the pharmacopœias is the *Vitex agnus castus; foliis digitatis*, *serratis*, *spicis verticillatis* Linn. The seeds are the medicinal part, which have, when fresh, a fragrant smell, and an acrid aromatic taste. These, however, are fallen into disuse.

AGNUS SCY'THICUS; the *Scythian lamb;* called also in the Scythian language *barametz*, i. e. *lamb;* or *boronetz*, or *boronetz;* a sort of plant said to grow in Tartary, Russia, &c. and described as bearing the resemblance of a lamb. But the truth seems to be, that when designing persons have met with this plant which seemed to have some distant resemblance to a lamb, they increased the lamb-like appearance by covering their vegetable subject with the skin of a young lamb that had been cut out of the ewe for this purpose. Thus those who were not aware of the difference of a lamb's skin whilst it is in the fœtal state, and after it is yeaned, had these frauds imposed on them for natural vegetable productions. The Persian lambskins, called *Persianish baranken*, are skins which are stripped from the lambs in their fœtal state, and thus, being much finer and more delicate, are fitter for the sumptuous dresses of the rich.

AGOMPHIASIS, (αγομφιασις; from α, neg. and γομφος, compact); a looseness of the teeth, attended with pain.

AGONIA, (αγωνια; from α, priv. and γονος, an offspring); sterility, or barrenness in women. See BARRENNESS.

AGONIA, (αγωνια; from the greek word αγωνιαω, to struggle); agony, as when there

is a struggle between life and death. Also fear and sadness of mind.

AGONISTICUM, (from αγωνιαω, *to strive*). Galen, in speaking of Marasmus, uses this word to signify water extremely cold, which he directs to be given in large quantities in erysipelatous fevers, that it may overpower the excessive heat of the blood.

A'GONOS, (from α, neg. and γονος, *an offspring*); barrenness. Hippocrates calls those women so who have not children, though they might have, if the impediment was removed. In botany it means not bearing seed or fruit.

AGO'STUS, (from αγω, *to bring* or *lead*); that part of the arm from the elbow to the fingers. See Palma.

AGRE'DULA; a species of frog.

AGRE'STA, (from αγριος, *wild*); *Verjuice*. The juice of unripe grapes, or the sour grape itself, called omphax, or the juice of the sour apple. See Malus hortensis.

AGRES'TEN; a name for the common tartar.

AGRES'TIS, (from αγριος, *wild*); a term applied to vegetables that grow without cultivation. In the works of some old writers it expresses an ungovernable malignity in a disease. It also distinguishes wild from tame animals.

AGRIA, (αγρια; from αγριος, wild); the tree named Holly. A malignant pustule has been also named *Agria*.

AGRIA'MPELOS, (from αγριος, *wild*, and αμπελος, *a vine*); the wild vine; Bryonia alba. See Bryonia.

AGRIFO'LIUM, (from ακις, *a prickle*, and φυλλον, *a leaf*). See Aquifolium.

AGRIMONIA EUPATORIA, (called thus, from *Eupator*, who first used it; or quasi *hepatorium*, ηπατοριον; from ηπαρ, the liver; because it is useful in diseases of the liver); the systematic name for the *Agrimonia* of the pharmacopœias. See Agrimonia.

AGRIMO'NIA, (from the Greek αγρος, *a field*, and μονος, *alone*); so named from its being the chief of all wild herbs. Common Agrimony, is the *Agrimonia Eupatoria*, or *Agrimonia foliis caulinis pinnatis, foliolis undique serratis, omnibus minutis interstinctis, fructibus hispidis* Linn.

It is a hairy plant, with winged leaves composed of oblong indented segments, with small portions between, set on middle ribs, which stand alternately on the stalk; on the top grows a long spike of pentapetalous yellow flowers, followed by little burs, containing each one or two seeds. It is perennial, grows wild in hedges, and about the sides of the fields, and flowers in May.

The leaves have a slight bitterish aromatic taste, the flowers are small, stronger and more agreeable; they give out their virtues to water and to spirit of wine.

It is best used while fresh; and the tops, before the flowers are formed, possess the most virtue. A conserve is the usual form of preparation; but an infusion in water or whey was formerly employed in diseases arising from a lax habit. Dr. Alston, of Edinburgh, advised the powder of this herb as the best mode of administering it, when given with the intention to corroborate; and thus taken, in a large quantity, he says we may expect many of the effects of the bark from it in agues. Dr. Cullen, however, says it has some astringent powers, but they are feeble, and pays little attention to what has been said in its favour.

AGRIMONOI'DES, (from αγριμονη, and ειδος, *like*); called also pimpinella foliis agrimoniæ nonnullis. It grows on the mountains of Italy; and is of the same nature as agrimony.

AGRIOCA'RDAMUM, (from αγριος, *wild*, and καρδαμον, *nasturtium*). See Lepideum.

AGRIOCA'STANUM, (from αγριος, *wild*, and καστανον, *the chesnut*). See Bulbocastanum.

AGRIOCI'NARA, (from αγριος, *wild*, and κιναρα, *artichoke*). See Cinara.

AGRIOCOCCIME'LA, (from αγριος, *wild*, κοκκος, *a berry*, and μηλεα, *an apple-tree*). See Prunus Sylvestris.

AGRIOME'LA, (from αγριος, *wild*, and μηλεα, an *apple-tree*. See Malus Sylvestris.

AGRIORI'GANUM, (αγριος, and οριγανον, *marjoram*. See Origanum.

AGRIOSELI'NUM, (αγριος, and σελινον, *parsley*). See Hipposelinum.

AGRIPA'LMA GALLIS, (αγριος, and παλμα, *palm-tree*. See Cardiaca.

AGRI'PPÆ. Those children which are born feet foremost are so called, because that was said to be the case with Agrippa the Roman, who was named *ab ægro partu*, from his difficult birth. These births, though reckoned preternatural, are often more safe and eafy than the natural. See Presentation.

AGRO'STIS, (αγρος, *a field*). See Bryonia.

AGRYPNIA, (αγρυπνια; from α, priv. and υπνος, sleep); watchful; without sleep.

AGUE. See Intermittent.

AGY'RTÆ, (from αγυρις, *a crowd of people*, or from αγειρω, *to gather together*); *Quacks, Mountebanks*, or people who go from place to place to sell medicines. These also were called *circulatores, circumforanei*, and *pharmacopolæ*; the last of which, though proper to any seller of medicines, yet was strictly applied to mountebanks.

AHO'VAI THEVETICLU'SII, or ahouai, *haouvay*; the name of a poisonous fruit in Brasil, the size of a chesnut, white, and shaped like the

water caltrops. The tree is as large as a pear-tree, the bark white and full of juice, the leaves are always green, the flower consists of one leaf, formed like a funnel, divided at the edge; a pistil arises from the cup, which is the fruit. Incisions in the bark emit a milky liquor that smells like garlick. Miller takes notice of two species, but we have no account of their medical properties.

AIR, termed, by modern philosophers, *atmospherical air* or the *Atmosphere;* an invisible, inodorous, compound fluid, capable of rarefaction and condensation, which every where invests the globe. It is composed of azot and oxygen gas, in the proportion of 73 of azot to 27 of oxygen in a state of mixture. Its physical properties are, fluidity, invisibility, want of taste and smell, gravity, and elasticity. The chemical properties are of two kinds, viz. the property of promoting combustion, and the power of maintaining the life of animals that respire it. See ATMOSPHERE.

AISTHETERIUM, (αισθητηριον; from αισθανομαι, to perceive); the *Sensorium commune.* See SENSORIUM.

AIX LA CHAPELLE, a large town in the south of France, where there is a sulphureous water, the most striking feature of which, and what is almost peculiar to it, is the unusual quantity of sulphur it contains. The whole, however, is so far united to a gazeous basis, as to be entirely volatalized by heat; so that none is left in the residuum after evaporation. The heat of the hottest spring, Dr. Lucas says, raises the quicksilver in Fahrenheit's thermometer to 136; but Mons. Monet to 146; and the heat of the fountain, where they commonly drink, to 112. Dr. Lucas evaporated a gallon of the water drawn from the hottest spring, and procured 268 grains of a solid matter, composed of 15 grains of calcareous earth, 40 of selenites, and 243 of a saline matter, made up of natron and sea salt. Bergman obtained from a Swedish kanne 27 grains of lime, saturated with carbonic acid, 29 grains of sea salt, and 70 grains of mineral alkali. These waters are powerfully diaphoretic, and diuretic; and, if taken in quantity, prove purgative. The medical water at this place is reputed volatile, sulphureous, saponaceous, powerfully penetrating and resolvent; it also contains a portion of iron. Some, however, assert that it does not contain any iron. Of the three hot European waters of note; viz. that of *Aix la Chapelle*, Bourbon, and Harrowgate, the first abounds more eminently with sulphur, whence it is the hottest, the most nauseous, and purgative. The Harrowgate waters possess the least of these qualities. With regard to the dose of this water to be begun with, or the degree of heat to bathe in, it is in all cases best to begin with small quantities, and low degrees of heat, and gradually increase them, agreeably to the effects and constitution of the patient. In cases of dyspepsia, and foulness of the primæ viæ produced by intemperance, they are said to be efficacious: also in rheumatisms, scurvy, scrophula, cutaneous diseases; in hysteria, and hypochondriasis; in paralytic and nephritic complaints, and in many other cases. They are considered as invigorators of the system, deobstruent, and evacuant. These qualities, which point out their uses, shew also where their administration would be improper. The usual time of the year for drinking these waters is from the beginning of May to the middle of June; or from the middle of August to the latter end of September. See HARROWGATE.

AIZO'UM, (αει, *always*, and ζωω, *vivo*, *to live)*. See ALOIDES. It is also a name for *sedum.*

AJA'VA, a name given by the Portuguese to a seed which is brought from Malabar, and is celebrated in the East Indies as a remedy for the cholic, and gout. When the latter affects the stomach, these seeds are very effectual in dispelling wind, and procuring speedy relief from this painful disorder: they sometimes relieve by procuring a stool or two. Dr. Percival takes notice of these seeds in his Essays Medical and Experimental.

AJU'GA PYRAMIDALIS, the systematic name for the *Consolida media* of the pharmacopœias. See CONSOLIDA MEDIA.

A'LA, a name for the arm-pit. In *Botany*, the two side-petals in a papilionaceous corolla: also membranes affixed to the seeds. It used to be applied to the angle formed by a branch with the stem, or by a leaf with the branch; but this is now named *axilla*, from its similarity to the arm-pit.

ALABASTRUM; ALABASTER, a solid kind of white gypsum, of which utensils were formerly made. It is most probable that it received its name from Alabastrum, a town in Ægypt, where it was plentifully produced.

ALÆ, wings. This term is frequently applied to any part extended like a wing, as the alæ of the sphænoid bone. The upper portion of the external ear is called *ala auris.*

ALÆ NASI, OR PINNA NASI; the lateral and moveable parts of the nose; the nostrils.

ALÆ VESPERTILIONUM; that part of the ligaments of the uterus, which lies between the tubes and the *ovaria:* so called from its resemblance to the wing of a bat.

ALBA'RA, (from *albahrah*, a Chaldæan word); a species of the white leprosy, see ALPHUS. It also signifies the white poplar. *Albarus niger* is the *lepra Græcorum.* Avicenna calls thus the *lepra icthyosis.*

ALBA'TIO, (from *albeo*, *to whiten);* also ALBIFICA'TIO, (from *albus*, *white*, and *fio*, *to make);* a chemical term, which signifies to whiten metal, called blanching.

A'LBERAS; mattery pustules upon the face.

See ALBORA. It is also a name given to stavesacre, because its juice is said to remove these pustules. See STAPHIS AGRIA.

ALBICA'NTIA, *corpora*, (from *albeo*, *to grow white)*; a name for Willis's glands. See CEREBRUM.

ALBIFICA'TIO. See ALBATIO.

A'LBIMEC, *Orpiment*. See AURIPIGMENTUM.

ALBI'NUM, (from *albus*, *white*; so called from the whiteness of its blossom). See GNAPHALIUM.

A'LBOR O'VI, the *white of an egg*. See ALBUMEN.

A'LBORA, a sort of itch, or rather leprosy, described by ancient writers. Paracelsus says, it is a complication of the morphew, serpigo, and leprosy. When cicatrices appear in the face like the serpigo, and then turn to small blisters of the nature of morphew, it is the *albora*. It terminates without ulceration, but by fetid excoriations in the mouth and nostrils; it is also seated in the root of the tongue. Internal medicines, as well as corrosive ones, are forbidden in the treatment.

ALBUGI'NEA OCULI, or *tunica albuginea*, (from *albus*, white). See ADNATA.

ALBUGINEA TESTIS, (*albuginea*; from *albus*, white: so called on account of its white colour); the innermost coat of the testicle, called *tunica Albuginea*. It is a strong, white, and dense membrane, immediately covering the body or substance of the testicle. On its outer surface it is smooth, but rough and uneven on the inner. From the upper part of this membrane proceed the blood vessels, nerves, and lymphatics, which send branches into the testicle. It is this coat being distended, which is the cause of the great pain that attends an inflammation of the testis.

ALBU'GO OCULI, (from *albus*, white); a white speck or opacity of the cornea.

Some distinguish this disorder by the term *nubecula*, when its seat is superficial; and *albugo*, when it is deep. Others, when the speck appears of a shining white, and without pain, call it a *cicatrice*; when of an opake whiteness, an *albugo*; seated superficially, a *speck*; and more deeply, a *dragon*. If caused by an abcess, its contents, hardening between the laminæ of the cornea, cause it to project a little, and then it is called a *pearl*.

The causes are various; as inflammation in the eye (see OPHTHALMIA), abscess in the cornea, measles, small-pox, wounds, burns, &c. When the *albugo* is of long standing and penetrates deep, the cure is difficult; when the consequence of a wound or ulcer, it is rarely cured; when caused by an imprudent use of strong collyria, and when the natural shape of the eye is altered, the prognostic is unfavourable. Those, however, which follow an inflammation frequently disappear spontaneously.

On the occurrence of ophthalmia, after the small-pox, measles, or other general inflammatory diseases, the utmost haste should be made to relieve, by bleeding, purging, blistering, and an abstemious diet. By this means, an albugo will either be wholly prevented, or be so inconsiderable, as, perhaps, to disappear of itself, or with the assistance of the least active remedies, such as lime water, calomel, powdered loaf sugar, &c. introduced into the eye. If however, the offuscation of the cornea, so far obstruct the passage of light as to diminish or prevent vision, more decisive means must be used, such as the following:

℞ Sacchari conditi } opt. lævig. sing.
Ossis sepiæ } drach. j.
Calomelanos scrup. j.
Mellis rosæ q. s. Misce.

The following ointment, invented by M. Pellier, is recommended by Mr. Bell, for the like purposes;

℞ Hydrargyri nitrati rubri,
Lapidis calaminaris præparati, sing. drach. iss.
Lithargyri lævigati drach. j.
Tutiæ præparatæ drach. ss.
Hydragyri sulphurati rubri scrup. j.
Balsami Peruviani gutt. xv.
Adipis suillæ præparatæ unc. ij. Misce.

Or this, which is the *unguentum ad lippitudinem* of St. Thomas's hospital in London:

℞ Ceræ albæ drach. ij.
Adipis suillæ præparatæ drach. vj.
Hydrargyri nitrati rubri optime lævig. drach. j.
Opii, in pulverem triti, gran. xij. Misce.

Or the following ointment of Dr. de Gravers, which is employed, in such cases, at the Liverpool infirmary.

℞ Calcis hydrargyri albæ,
Tutiæ præparatæ,
Lapidis calaminaris præparati, sing. drach. ij.
Tincturæ benzoes compositæ drach. j.
Adipis suillæ præparatæ drach. iij. Misce.

In cases of less moment:

℞ Chryst. tartar. } optime pulver. aa ℥ij. Misce.
Sacchari alb. }

In many cases of opacity in the cornea, the cure may be gradually effected by the application of finely powdered glass.

Where means much less active may be thought sufficient;

℞ Æruginis præparatæ gran. iv.
Ammoniæ muriatæ drach. ss.
Aquæ calcis recentis unc. viij. Misce.

This is the *aqua cupri ammoniati* of the new London Pharmacopœia, but prepared after that of Edinburgh with regard to the manner of introduc-

ing the copper. It is useful, when diluted, as a general collyrium also, after the inflammatory stage; but it is to be observed, that its introduction *into* the eye is indispensably necessary. In fact, the cure consists in attempting to remove the disease by that which, perhaps, produced it; to wit, by the reproduction of inflammation; a means which nature herself frequently resorts to for the restoration of diseased parts.

ALBUMEN, albuminous matter, or coagulable lymph. This is very abundant in the animal kingdom. It is the principal constituent part of the serum of the blood, and the lymphatic fluid. It forms the cheese in milk, and makes up the greater part of the eggs of birds. It is composed of carbon, hydrogen, azot, oxygen, phosphorus, and some calcareous earth.

ALBUMEN OVI; the white of a bird's egg. This is a pellucid viscous liquor, which, in its consistence, is thinner towards each end, and thicker in the middle. That part which is more dense and close than the rest is called *gallatura*, and supplies the chick within the egg, during incubation, with its first nourishment. In each egg there are two *albumens*, involved in their proper membranes: of these, the one is very liquid, and is next to the shell; the other is more dense and viscous, and immediately surrounds the yolk. There are also two branches of umbilical veins in the egg; one going to the white, and the other to the yolk. The white is specifically lighter than the yolk: it is condensed by a degree of heat, in which the yolk will retain its softness. The yolk is dried more in boiling than roasting: when it becomes warm by incubation, it is more humid, and like melting fat.

The chick in the egg is first nourished by the thinner or outer *albumen*, then by the inner and more viscous, and lastly by the yolk. The umbilical veins that go to the white, when it is spent, wither, and leave no signs of their having existed, by the time that the chicken is hatched. During the whole incubation, the white is as sweet as when the egg was newly laid.

The white of an egg forms a more solid coagulum than serum, but in other respects they are the same, if put into boiling water. Alcohol coagulates the white of egg, and it does the same with serum, on which account alcohol is applied to bleeding vessels as a styptic.

The albumen of fresh-laid eggs, if taken while warm from the hen, is extremely nourishing to the infirm. It may be taken in luke-warm milk; but some say, if any other heat is applied to it, the beneficial quality will be destroyed. The fresh white of egg prevents burns from rising in blisters, if it is used immediately after the accident: coagulated, by being briskly stirred with a lump of alum, and applied as a cataplasm, it mitigates inflammation of the eyes. Eggs given raw every morning, have been useful in the jaundice in infants, and to others in bilious complaints.

In pharmacy, the yolk is used as a medium to render balsams and tupentines, &c. miscible with aqueous fluids; but as it disagrees with many stomachs when thus taken, a mucilage of gum arabic may supply its place, it being as good a medium in similar circumstances, and not apt to offend the most irritable stomach. The eggs of all birds are pretty nearly similar with regard to their flavour and nutritious effects, yet some are of a deeper colour and more tenacious than others. It is surprising what a quantity of eggs have been eaten at once, and digested, by some persons; but, in most, this power is very limited; for a smaller bulk of this highly nutritive matter, will usually satisfy the digestive powers. Egg is a more alcalescent food than any other animal substance; and, during digestion, is less stimulant. See the article EGG.

ALCALI. See ALKALI.

ALCÆA ROSIA, the systematic name for the *Malva arborea*. See MALVA.

ALCHEMILLA, (so called because it was celebrated as a medicine by the alchemists); the plant, called Lady's mantle. The name given to it in the pharmacopœias is *Alchemilla vulgaris*, *foliis lobatis* Linn. Given internally, it was formerly esteemed a powerful astringent in hemorrhages, fluor albus, &c.

ALCHEMY, (*alchemia*, from the Arabic particle *al*, which is added by way of eminence, and χυω, to *melt*); that part of chemistry which relates particularly to the transmutation of metals.

ALCOHOL. See ALKOHOL.

ALDER TREE. See ALNUS, and FRANGULA.

ALDER-BERRY, BEARING. See FRANGULA.

ALEGAR, OR ALLEGAR, an acetous liquor made from an infusion of malt, which is suffered to go through the two stages of fermentation. It is used for vinegar, very commonly, by country people, in those situations where ale is the common beverage. See ACETUM.

ALEMBIC. This word is half Arabic and half Greek. From the Arabic particle *al*, and αμβιξ, which is again derived from αμϐαινω, or αναϐαινω, *to ascend*. Seneca calls it in the Latin language *miliarium*; in English it is called *alembic* and *moor's-head*. It is a copper cap tinned in the inside, made like a head; to this the pipe (before worms were contrived) which passes through a tub of cold water was fixed, to receive the vapour from the vessel containing the matters to be distilled, aad to convey it to the receiver. This head is properly the alembic, and is called *alembicus rostratus*, i. e. the *beaked alembic*, to distinguish it from *alembicus cæcus*, or *blind alembic*, which is without a tube, as it is to receive dry substances

that are sublimed into it. The still-head is properly an alembic.

ALEXANDERS, COMMON, the *Smyrnium olusatrum* of Linnæus. It was formerly cultivated for sallads, but is now superseded for celery.

ALEXANDERS, ROUND-LEAVED, the *Smyrnium perfoliatum* Linn. The blanched stalks of this species are far preferable to those of common alexanders, and are esteemed good as stomachic and corroborant remedies.

ALEXIPHARMICS, *(alexipharmica,* from *αλεξω,* to *expel,* and *φαρμακον,* a *poison);* medicines supposed to possess the power of counteracting poisons. The ancients attributed this property to some vegetables, and even waters distilled from them. The term, however, is now disused.

ALGE'DO, (derived from *αλγος, pain);* a violent pain about the anus, perinæum, testes, urethra, and bladder, arising from the sudden stoppage of a virulent gonorrhea. It is a term very seldom used by modern writers.

AL'GOR, a sudden chillness or rigor. This term is met with in Sauvage's and Sagar's nosology.

ALIENATION OF MIND. See Mania.

ALIFORMES MUSCULI. See Pterigoid muscles.

ALIFORM, *(aliformis,* from *ala,* a *wing,* and *forma, resemblance);* wing-like, or having the appearance of a wing. See Alæ.

ALIMENTS; those substances which, taken into the stomach, are fitted to afford and supply the fluid and solid matter of which the body is composed. It has the familiar name of food.

Dr. Cullen observes, that all aliment differs in two particulars; first, as it is already assimilated into the animal nature, or requires to be *converted* into it, by a particular process of the animal œconomy. Of the first kind are all *animal substances,* which, if not similar, are nearly so to our nature, and require only for that assimilation *solution* and *mixture.* The second kind comprehends *vegetables,* which must undergo several changes before they can be assimilated. But as the nourishment of all animals, even of those that live on other animals, can originally be traced to the vegetable kingdom, it is plain that the principle of all nourishment is in vegetables, and that, therefore, we ought to attend particularly to these.

Respecting *vegetable aliment,* the first question that arises is, What are the vegetables which are peculiarly appropriate for food? Perhaps there is no vegetable but what affords aliment to some animal; but Dr. Cullen insists, that, in human aliment, a choice is necessary, and that a distinction ought to be made. His first distinction is, that those vegetables which are of a mild, bland, agreeable taste, are proper for *nourishment;* while those of an acrid, bitter, nauseous nature are improper. Every body indeed will allow the truth of this. There are, however, several *acrid* substances that we use as food; but the mild, the bland, the agreeable, are in the largest proportion in every vegetable; whereas the acrid, the bitter, the disagreeable, enter in the least quantity. These last, however, may prove capable of nourishment, provided our system is capable of *subduing* their nature. Thus we see that some animals live on what is poisonous to others, which seems entirely owing to their particular *conformations* individually. Of all animals, man is the most delicate in the choice of his food, and the acrid, bitter, and disagreeable, are rarely, if ever, admitted as parts of his aliment. There, however, seem to be some exceptions: thus *celery* and *endive* are used in common food, both substances having considerable acrimony; but we must observe, that, when to be used, they are previously *blanched,* which entirely deprives them of that suspicious tendency. Or, if we employ other acrid substances, we generally, in a great measure, deprive them of their *acrimony* by boiling. In different countries the same plants grow with different degrees of acrimony. Thus garlic here seldom enters our food; but in the southern countries, where they grow more mild, they are frequently used for that purpose. Again, the plant which furnishes *cassada,* being very acrimonious, and even poisonous in its recent state, affords an instance of the necessity of preparation of acrid substances even in those countries; for, by a particular management, they allow the acrimonious juice to run off, and the farinaceous and nutritious part is left behind. Upon the whole therefore, Dr. Cullen contends, that we use no acrid substances in our food that are not previously deprived of their acrimony; or, if we do, that they are only employed as *condiments.* But if the question still remain, if it is yet urged, that acrid substances *are* employed in our food, still these are only such as the human body, by its particular *conformation,* is able to snbdue. Here, then, begins the division of plants into food and medicine, the mild, the bland, the agreeable plants, or their parts, being fit for food; while the acrid, &c. are proper for medicine. For this reason Linnæus's aphorisms are well founded, "*insipida & inodora nutriunt; sapidiora non nutriunt.*" The reason is very obvious; for unless substances *affect remarkably* our organs of sense, they cannot be supposed to operate powerfully on our system; and this very effect destroys their *expediency* as food. Again, as sapid and odorous substances have the power of operating changes in our system, they must act on the *nervous power,* the part chiefly changeable. The insipid and bland vegetables do, indeed, act on our fluids, but the changes they produce must be very slowly effected.

Taking a view of the whole of the fluids of the

body, they seem distinguishable into many different kinds; but we can particularly distinguish those, pretty constantly in the course of the circulation, and which we call the *common mass*, from those that are found in other vessels than those concerned in the circulation. These, however, being all of them, as we presume, drawn from the common mass, and therefore originally of the same matter, we shall inquire at present only into the nature and production of that matter which contributes to the former.

Dr. Cullen observes, that, besides elementary water, which always makes the largest portion of the human fluids, the next considerable part of the common mass is what has been named the gluten or coagulable lymph. This he considers the chief part of the mass, and that which gives the matter of the solids, or the permanent constituent parts of the body, and which, from the beginning to the end of life, are constantly receiving a further increase. That the gluten is that part of the fluids which affords the matter of the solids, is sufficiently probable from this; that in all its qualities it very nearly resembles the solid matter of the body, while in any other part of the fluids there is no such resemblance. Therefore, this gluten is held to be the chief part of the fluids; and considering how much of it is diffused among the other fluids, and how much of it is dissolved in the serum or serosity, it is certainly, next to the water, the largest portion of the common mass. It may, consequently, be viewed as that into which the aliments, so far as they are nutritious, are converted, and therefore may be considered as the proper *animal fluid*, or, as Dr. Cullen frequently calls it, *animal mixt*.

In accounting for the other matters that appear to be in the common mass, he observes, that, when this animal mixt is fully formed, it does not long remain stationary in that condition, but seems to be constantly, although perhaps slowly, proceeding to a putrid or putrescent state; as we know that, if fresh aliment be not constantly supplied, the whole of the fluids will in no long time become very putrid. In this progress, as in other processes of putrefaction, we find the mild and perfectly neutral substance changed into a saline state of the ammoniacal kind; and this saline matter being washed off from the entire gluten by the water which constantly accompanies it, seems to form the *serosity* of the common mass. It is this again which nature, in order to prevent an undue accumulation of it, has provided for being carried out of the body by the several excretions, and that in the proportion necessary to preserve health. Thus, the portion of the common mass, which is termed the serosity, and which seems different from the animal mixt, is, however, formed from this, and does not therefore lead to the supposition of any other supply of alimentary matter than what is necessary to that particular end.

In accounting for another portion of the common mass, the doctor remarks, "that the animal fluid is considerably different in its qualities from the vegetable matter of which it is often entirely formed, and that this vegetable matter, after it has been taken into the body, is thus changed by the peculiar powers of the animal œconomy. This change, however, is only gradually and slowly made; and it is not completed till the aliments, and chyle made of them, are taken into the blood-vessels; and probably, even in these, it requires some time to be finished. From hence we may perceive that a portion of the common mass is always for some time in an unassimilated state: and we have thus a view of the common mass as being made up of three several parts; the one being a portion of unassimilated matter, which is to be formed into the animal mixt; the second being the animal mixt completely formed; and the third being formed from that mixt in its progress towards putrefaction. Although, therefore, the matter may be seemingly different in its different states, we find nothing to lead us to doubt of its being always made of the same alimentary matter."

Since it may be reasonably supposed, that the whole of the circulating mass consists very entirely of the matters just now mentioned, so we may conclude, that a different kind of aliment is not necessary to form the fluid, from that which is necessary to form the solid, parts of the human frame.

Yet here a difficulty occurs from that portion of the common mass, and that also constantly, present in it, which is peculiarly different from the gluten in any of the states of it. This portion of it is that of the *red globules;* the formation of which from any state of the gluten, cannot be explained; and it might therefore be supposed, that a peculiar kind of alimentary matter afforded this peculiar portion of the blood. "It may possibly be so," says Dr. Cullen; "but so far as I am acquainted with the subject, we do not know any part of the alimentary matters that seems adapted to this purpose: and as the red globules seem to be commonly in the same proportion to the gluten, and, the vigour of the constitution being given, that the quantity of both is in proportion to the quantity of the same kind of aliment taken in; so we may presume that the red globules, by certain powers of the animal œconomy, are made of the same aliment as the gluten. Again, therefore, I conclude, that *there is no ground for supposing the aliment supplying the fluids of the common mass to be different from that which is fitted for supplying the matter of the human solids.*

"Another question, however, is, Whether any of the secreted fluids found out of the course of

the circulation, but necessary to the animal economy, require an aliment different from what is necessary to form the fluids of the common mass in the manner we have supposed? The negative of this we cannot indeed assert, but can justly say, that the affirmative is a gratuitous supposition without any proof. Indeed, while we can account for the production of the common mass from the different aliments taken in, and at the same time pretty clearly perceive that the whole of the secreted fluids are drawn entirely from that mass, it will be with greater probability supposed, that the secreted fluids are, by the wonderful power of secretion, formed out of the common mass by a combination of the different states of that, or of different secretions, than that any of them are formed of peculiar aliments. Upon the whole, therefore, I again conclude, that the solids, and the whole of the fluids, are formed out of one and the same kind of aliment."

Dr. Cullen does not attempt to ascertain exactly what that common aliment is, or, if ascertained, to explain how it is adapted to its purpose, but merely to simplify the question as much as possible. Upon this plan, therefore, he inquires, What are the proper aliments of the human species? In answer to this, he says: "We know, that the human aliments are taken entirely either from other animals, or from vegetables, and that no part of them excepting water is taken from the fossil kingdom. The substances employed are seemingly various; and, in order to know the greater or less fitness of the individuals, it is requisite to consider in general how animal and vegetable matters are suited to give nourishment to the human body.

"With respect to the former, the most parts of the matter taken from animals are so nearly of the same qualities with the matter of the human body, that there is little difficulty in supposing that the animal matters taken into the human body, as aliments, are perfectly well suited to this purpose, and requiring only the means of solution and mixture, with very little change of their qualities. It is true, indeed, that in many of the animal substances we take in, the likeness of qualities to those of the human body is not always exact and complete; and we shall hereafter have occasion to take notice of this: but, in the mean while, all of them agree so much in the qualities which chiefly characterise the human fluids, that we may presume on their being a matter so nearly the same, that the former may be very well suited to supply the latter.

"To supersede, however, any further anxious inquiry upon this subject, we may suppose it to be highly probable, that *all animal matter is originally formed of vegetable;* because all animals either feed directly or entirely on vegetables, or upon other animals that do so. From hence it is probable, that all animal substances may be traced to a vegetable origin; and therefore, if we would inquire into the production of animal matter, we must first inquire in what manner vegetable matter may be converted into animal? And this question relates especially to the human body; the nourishment of which is, in a great measure, immediately taken from vegetables.

"In attempting this, we shall find that the conversion mentioned is the effect of a peculiar power in the animal œconomy; which, it must be acknowledged, is by no means clearly or fully understood. We shall, however, make some steps towards understanding it better; and, to this purpose, there is one step absolutely necessary, which is, to determine amongst the seemingly great variety of vegetable matter, which is the kind that is especially, or perhaps only, fitted to be converted into animal? Or if this question, as thus put, be too general, it may then be to determine, what are the vegetable substances chiefly fitted for being converted into the substance of the human body? Nothing is more evident than that every vegetable, or every part of any one vegetable, is not suited to this last mentioned purpose; and therefore it is necessary, both for the sake of the general question, and also for the particular purpose of the materia medica, to determine as well as we are able what vegetables, and what part of them, are most fit for the nourishment of the human body.

"In pursuing this inquiry, it is to be remarked, in the first place, that, for the most part, those vegetables are rejected from the list of aliments that are imbued with any strong odour or taste; and, at least of the sapid, all except the acid and sweet are excluded. To this perhaps there are a few exceptions; as, when the odorous or sapid part is in small proportion to the rest of the vegetable substance; when the odorous or sapid parts are such as pass quickly out of the body again by the excretions; or when they are such as admit of their qualities being entirely changed by the powers of digestion in the first passages. Such exceptions, however, hardly affect the general doctrine; which is very much confirmed by this, that several vegetables which in their acrid state are unfit or even noxious, by being deprived of their acrimony by culture, by blanching, by drying, or by boiling, are rendered quite proper: and if there shall still be exceptions not to be accounted for in any of these ways, I would maintain, that such acrid substances are admitted and taken in as condiments rather than as nutriments.

"This consideration of the exclusion of acrid matters from among our foods, is to be applied in this manner. As the acrid, odorous, or sapid parts, seem for the most part to be the peculiar matter of particular vegetables, and to be even

but a small portion of these, seldom diffused over the whole, but deposited in certain parts of them only; and as this is more especially the case in those vegetables which are taken in as food; so we from thence conclude, that, besides these peculiar matters, there is in the most part of vegetables a considerable quantity of matter, which, for reasons to be given hereafter, is manifestly in common to almost the whole of the vegetable kingdom. This we shall speak of as the common matter of vegetables, and having laid aside, as above, the peculiar, it is in the common matter that we are necessarily led to seek the vegetable substance that is suited to the nourishment of the human body."

But, though most vegetables are of an alimentary quality, they are not all equally so; and it is from daily experience evident, that certain vegetables, and again certain parts of the same vegetables, contain a greater portion of this alimentary matter than others.

In inquiring after the particular substance of vegetables, or the particular parts of them that compose alimentary matter adapted to the human body, Dr. Cullen first observes, that, contrary to what others have said on the subject, there is no portion of matter to be found in any vegetable which is *directly* fitted to supply the animal fluid. This, however, together with water, seems to be the foundation of all other fluids in animal bodies; and particularly, that from which the nutritious matter applied to the increase of the solid parts is, by the powers of the œconomy, formed and prepared. It is this animal fluid, therefore, that our vegetable food is to be converted into; and it seems to be a matter formed not from any one kind, but, by the powers of the animal œconomy, from various kinds of vegetable matter. Accordingly, in saying that certain parts of vegetables are alimentary, we mean only that they are matters fitted to enter into the composition of the proper animal fluids.

As it appears that the nutritious matter of vegetables, whether in the whole or in the different parts of them, consists in acid, sugar, and oil, Dr. Cullen treats of these three substances particularly, and endeavours to show that they really enter into the composition of the human fluids.

1. *Acid.*—This appears in the whole substance of many of our vegetables, and is frequently very copious in fruits. In these, indeed, it is commonly combined with more or less of sugar; but from what happens in the progress of the maturation of fruits, which is often the change of an acid into a saccharine matter, it is to be presumed that an acid enters largely into the composition of sugar, and is thereby a necessary ingredient in the composition of animal fluid. It may perhaps be alleged, that it is only such an ingredient as being a part of sugar; but it seems probable that it is also such in its separate state. It seems indeed sufficiently proved, that every kind of vegetable aliment, except the purely oily, is capable of an acescent fermentation; and that every such aliment, soon after it is taken into the stomach of an healthy person, undergoes such a fermentation; whereby an acid is always more or less evolved. Yet it must be allowed, that as in the further progress of the aliment this acid disappears entirely from the mass of blood, so its having entered into the composition of the animal fluid can hardly be doubted; and if this constantly takes place, we may conclude, that an acid, purely *as such*, is a necessary part of the animal fluid. This argument is farther supported by the fact, that acescent substances are so far a necessary part of the human aliment, that, without them, the animal fluid advances much faster towards a putrid state; and diseases of putrescency, such as the scurvy, we know are cured by the taking in of acescent aliments, and most effectually by those in a very acid state, as lemons, or vegetables converted by art into an acid state, as *sour kraut.* These must certainly operate by entering into the composition of the animal fluid, and by rendering it less putrescent.

Dr. Cullen, however, confines this property to the native acid of vegetables only; for there is reason to believe, that the fossil acids do not enter into the composition of the animal fluid, but pass unchanged into the secretions. The same is to be suspected also with regard to certain acids that may be called vegetable; such as the acid of tartar, the distilled acid of tar, and even that it is so likewise with respect to the fermented acid or vinegar, when taken in large quantity. If the latter be taken moderately, it is very probable, from its being so commonly employed in diet by a great part of mankind, that it enters considerably into the composition of the animal fluid. Upon the whole, therefore, Dr. Cullen concludes, that the *alimentary quality of acid is confined to the native acid of vegetables*, as it is naturally formed, or as it is evolved from acescent vegetables, or from sugar in the process of digestion.

2. *Sugar.*—This substance, whether in its saline state, taken by itself, without any mixture of oleaginous matter, cannot be clearly proved alimentary; but Dr. Cullen says, when advanced nearly to a saline state, as in the sugar-cane, it may have alimentary properties. This, he says, is presumed from a well known fact in the sugar plantations, that the negroes grow fat, during the expression of the canes, from taking a great deal of the cane-juice. It is also a fact, that the inhabitants of warmer climates live very much upon fruits, whose substance in a great part consists of sugar; and indeed these fruits are more or less nourishing in proportion as they contain more or less of sugar. Figs, a very saccharine fruit,

were anciently the chief food of the Athletæ or public wrestlers in Rome. The roots of alimentary vegetables, such as the parsnip, carrot, beet, &c. contain a great deal of sugar, quantities of which have been extracted from them; so that it can hardly be doubted that much of their nutritious power depends on this ingredient.

A decisive proof, however, of the nutritious quality of sugar, is, that it is contained in all farinaceous matter, as we well know from its being evolved from the most of the farinaceous seeds by their germination, or the process of malting, after which they are also universally liable to a vinous or acetous fermentation.

3. *Oil*.—Dr. Cullen contends, that even the oil which is taken into the body in the form of a pure oil, though entirely separate from other vegetable matter, enters in a large proportion into the composition of the animal fluid; and he considers oil, therefore, in the strictest sense as a fundamental part of the human aliment. His reasons for this opinion are stated at large in his Treatise on the Mat. Med. vol. 1. p. 233.

On the supposed nutritious effects arising from the mucilaginous part of vegetables, he says, "It seems to be very well ascertained, that gum arabic, the most simple and pure mucilage, is an alimentary matter; and as gelatinous matter is commonly supposed to be the form in which our nutritious juice is applied, it may be supposed that this mucilage of gum arabic is to be considered as a simple substance, and in the same form directly applicable to the nourishment of the body. Perhaps it may be so; but many objections may be raised against the conclusion. At present it will be enough to say, that the gum mentioned is not a simple substance, but a compound of acid, sugar, and oil, and that thereby only it becomes nutritious. In its powdery form it resembles farina; and a further analogy may be drawn from hence, that salep, in its entire form, resembles very exactly the gum, and in its powdery form comes still nearer to the appearance and properties of a farina. The conclusion of a similar nature in these substances will be still more readily admitted, when it is considered how nearly the amylaceous part of the farina resembles the salep and gum in a powdered state; and it may be readily admitted, that the only difference between gum arabic and farina may be a little difference in the proportion of the several parts composing each. It may be supposed, therefore, that gum arabic, and other such mucilaginous matters, may be, like farina, chiefly composed of sugar and oil, which the vegetable œconomy may combine in different proportions, and under different appearances, which we cannot either imitate or explain.

"This further remark we may add:—that gum arabic contains a portion of sugar seems probable from the experiment which shows, that an acid exactly resembling the acid of sugar may be extracted from the gum, by a process like to that which extracts the acid from the sugar itself.

"It is again, therefore, concluded, that the vegetable matters affording aliment are acid, sugar, and oil, which in diet may be taken in, sometimes in their separate state; but may also, as they are more commonly, and perhaps more properly, be taken in a combined state; and in the latter case, either as they are combined in vegetable substances by nature, or as they are joined together by the cook in the preparations of diet".

After considering the alimentary vegetables with respect to their constituent parts, Dr. Cullen enters on another general consideration of them, namely, as it respects their being of different degrees of solubility in the stomach. This subject, however, more properly falls to be considered under the article Digestion. See also Animal Food.

ALKALI, (*alkali*, Arabic; and *alkalia* in the plural; so called from *kali*, one of the plants from which it is obtained); a substance which possesses the following characteristic properties: an acrid, burning, urinous taste; the property of converting syrup of violets into a green colour, but not the tincture of turnsole, as has been observed by some writers; the quality of forming glass, when fused with quartzose substances, and that of rendering oils miscible with water; of effervescing with certain acids, and of forming neutral salts with all of them.

It must be observed, however, that none of these characters is rigorous and exclusive, consequently that no one of them is sufficient to afford a certainty of the existence of an alkali; but the concurrence of several of them may be sufficient to lead to an accurate decision.

These substances are divided into fixed alkalis, and volatile alkalis; which distinction is established upon the smell of the substances: the former are not volatilized, even in the focus of a burning glass, consequently emit no characteristic smell; but the latter are easily reduced into vapour, and emit a very penetrating and suffocating odour.

Chemistry has not hitherto discovered any more than two kinds of fixed alkalis, one, which is called *vegetable alkali*, *pot-ash*, or, as some will have it, *pot-ass*; and the other, *mineral alkali*, or *soda*. See the articles Fixed Alkali, Ammoniac, Kali, Natron, &c.

The late Mr. Hunter found the exhibition of alkali internally of great use in some of the anomalous affections arising out of syphilis. Its use as a nephritic remedy has been generally acknowledged by practitioners. See Calculus. In the Transactions of the Society for Medical and Chirurgical Improvement, in London, Dr. G. Blane gives an account of the good effects of pure fixed alkali in

lessening the irritability of the bladder, in cases of indigestion, in eruptions, particularly of the face, called *gutta rosea*, and even in the gout. He prefers the mineral alkali, or *soda*, in stomach complaints; and in all cases recommends beginning with small doses, and increasing them gradually.

Dr. Cullen says, the fossile and vegetable fixed alkalis have, as far as we know, the same effects in medicine; but the fossile is the milder. Deprived of their air, or in their caustic state, they have the power of destroying animal substances altogether; and hence are employed as the common escharotics of the surgeons. The strongest caustic is always the best, soonest performing what is intended, and with the least pain. Prepared by itself, it is always fluid in the air, and it has been found useful to obtain it in a firm consistent form. For this purpose, the preparation of the London College *(calx cum kali puro)* is preferable, and the quick-lime there added, not only gives a dry form, but preserves the alkali in its caustic state.

When more dilute, it is a good solvent and detergent in various foulnesses of the skin, where matter sticks in the sebaceous excretories. It is extremely effectual in washing off every thing that adheres to the body, and hence at first gives a nitor and polish to the skin; but upon too frequent use, by washing out the sebaceous matter, it leaves it dry, shrivelled, and parched.

Boerhaave employed it as a detergent in ulcers; but in general, except such as are very foul, and covered with crust, ulcers do not bear saline medicines at all, as they all produce inflammation. In the stomach, fixed alkali may be absorbent, but, unless it meets with a sufficient quantity of acid, it will act as a stimulant, so that in this intention it is a very uncertain medicine, very apt to be over dosed, not exceeding in this property the absorbent earths, and not, like them, remaining innocent till an acid be produced to wash them away. Carried into the blood, and collected in the excretories, fixed alkali proves diuretic; and perhaps there is none more powerful in that operation. It has been employed in various cachectic, and especially hydropic, cases. Whether it acts by remaining alkaline, is doubtful. It is certainly proper to combine it with a little acid. In its caustic state the fixed alkali is always most powerful, but then it is too acrid. We should, however, use it as near to causticity as we conveniently can. Fixed alkali may be a powerful solvent of mucus, but lime-water is safer, and more effectual.

Dr. Huxham accuses fixed alkali as producing scurvy, probably only from theory: it may act, however, by absorbing acid, and so hurry on putrescency.

The pharmaceutical preparations of alkali are noticed under the foregoing heads, or under their several titles.

ALKALI, CAUSTIC. Alkalis are so called when deprived of the carbonic acid they contain; for they then become more caustic and more violent in their action. There are two kinds, the mineral, called *soda*, or caustic mineral alkali, in the new chemical nomenclature, and *natron* in the pharmacopœias; and *potassa*, or caustic vegetable alkali, of the new chemical nomenclature, and *kali* of the pharmacopœias. The volatile alkali, or *ammoniac*, is likewise called caustic volatile alkali.

ALKALI, FOSSILE. See Soda.

ALKALI, MINERAL; so called because it forms the basis of marine salt, a mineral production. See Soda.

ALKALI, VEGETABLE; so called because it abounds in many vegetables. See Potash.

ALKALI, VOLATILE; so called because it is volatile, in opposition to the other alkalis, which are fixed. See Ammoniac.

ALKALI VOLATILE NITRATUM. See Ammoniac.

ALKALI VOLATILE VITRIOLATUM. See Ammoniac.

ALKALINA, a class of substances, described by Dr. Cullen as comprehending the substances otherwise termed *antacida*. They consist of the alkalis, and also of substances into which they enter in combination, as neutral salts, soap, &c. Quick-lime is also included under this head.

Volatile alkali, he says, from its stimulus, can be given only in such small quantity at a time, that its attenuant powers cannot be observed, and that its operation is probably confined to the stomach, as a stimulant and antispasmodic.

Between *vegetable* and *fossile alkali*, he says, there is no difference in medical properties. "In their mild state they have no effects, as attenuant in the mass of blood. Out of the body, in that condition, they do not affect the coagulable lymph; *à fortiori*, not in the system. In their caustic state, out of the body, they *do* act upon the blood, and that very quickly, but all the difficulties which occur about the effect of substances on the blood, take place here; and to these an additional one is, that, in passing the stomach, they will always meet with an acid; and surely, with these disadvantages, and diffused in xij℔. of serosity, they can make little change in the mass of blood, in any quantity in which we can introduce them. Concentrated, however, in the secretions, their attenuant effects must be more considerable."

ALKALIZATION; the impregnating any thing with an alkaline salt, as spirit of wine, &c.

ALKANNA. See Anchusa.

ALKANNA VERA, an oriental plant; the *Lawsonia inermis*, *ramis inermibus*, Linn. It is principally employed in its native place as a dye. The root is the officinal part; which, however, is

rarely met with in the shops. It possesses astringent properties, and may be used as a substitute for the *anchusa*.

ALKEKENGI (*alkekengi*, Arab.); *Halicacabum*. The *winter cherry*, *physalis alkekengi; foliis geminis integris acutis, caule herbaceo, inferne subramoso* Linn. It is cultivated in our gardens. The berries are diuretic; from six to twelve are given for a dose, in dropsical and calculous cases.

ALKOHOL, (*alkohol*, derived from an Arabian word, which signifies antimony; so called from the usage of the eastern ladies to paint their eye-brows with antimony, reduced to a most subtle powder; which at last came to signify any thing exalted to its highest perfection). *Alkohol*, Edin. *Spiritus vinosus rectificatus*, Lond. *Spiritus vini rectificatus*, Dubl. Alkohol is the product of the operations of fermentation and distillation (see those articles). It is a very inflammable and very volatile substance. From the experiments of Mr. Lavoisier, it appears to be formed by the intimate union of much hydrogene and carbone. This chemist obtained eighteen ounces of water by burning one pound of alkohol. If well-dephlegmated alkohol be digested upon calcined pot-ash, and afterwards distilled, a very sweet alkohol is obtained, and a saponaceous extract, which affords alkohol, ammoniac, and an empyreumatic oil. In this experiment the formation of volatile alkali appears to arise from the combination of the hydrogene of the alkohol with the nitrogene of the pot-ash. Alkohol combines with water in any proportion, and is perfectly soluble in it; and so strong is the affinity of combination between these two fluids, that water is capable of separating from alkohol many of the other bodies which may be united with it; it also decomposes most saline solutions, and precipitates the salts. On account of its possessing this property, Boulduc has proposed the use of alkohol to precipitate the salt contained in mineral waters, and obtain them without alteration. It does not act on pure earths; nor do we know whether it be liable to be altered by barytes or magnesia. Lime appears to be capable of producing some change upon it; for when it is distilled on that earthy substance, the fluid acquires a peculiar smell.

Alkohol does not dissolve sulphur, either in masses or in a powder; but these two bodies unite, if brought into contact when they are both in a vaporous state, as has been discovered by the Count de Lauraguais. His process consists in putting sulphur in powder into a glass cucurbit, introducing into the same vessel, above the flowers of sulphur, a bottle filled with alkohol, and heating the cucurbit on a sand-bath, with a capital and a receiver adapted to it. Both the sulphur and alkohol are volatilized at the same time: they combine, and pass into the receiver, in a fluid which is somewhat turbid, and diffuses a fœtid smell. It contains about a grain of sulphur to the drachm of alkohol. Mr. Fourcroy has observed, that the same combination may be produced by distilling sulphureous waters with alkohol. It does not act at all on either metallic matters, or their oxides; but it partly dissolves amber. It is the solvent of resins, and of most aromatic substances, and consequently is of use in pharmacy, for the preparation of tinctures, &c. It also forms the basis of the art of the varnisher and of the perfumer, and has other valuable uses. If spirit of wine be combined with oxigene, it forms a liquor nearly insoluble in water, which is called *æther*. See Æther.

In England, alkohol is procured from molasses; in Scotland and Ireland, from an infusion of malt. This last, before its rectification, is termed *Whisky*. In the East Indies, *arrack* is distilled from rice; in the West Indies, *rum* from the sugar-cane; and in France and Spain, *brandy* from wine. Of all these, the last is the finest spirit; for the others are more or less impregnated with essential oils, unsavoury in their flavour, of which it is almost impossible to free them entirely. When any ardent spirit is redistilled to procure alkohol, the water-bath is commonly used, which gives a more equal and temperate heat, and improves the spirit. Gren says, that four pounds of charcoal, and three or four ounces of sulphuric acid, added previous to rectification, destroys entirely the peculiar taste of malt spirit; and that a second rectification with one pound of charcoal, and two ounces of sulphuric acid, affords an alkohol of very great purity. But the affinity of alkohol for water is so very strong, that it cannot be obtained entirely free from it by simple distillation. We usually, therefore, abstract the water by means of some substance which has a stronger affinity for it than alkohol has. Carbonate of potass was formerly employed; but muriate of lime is preferable, because its affinity for water is not only very great, but by being soluble in alkohol, it comes in contact with every particle of the fluid. For this purpose, one part of muriate of lime, rendered perfectly dry by having been exposed to a red heat, and powdered after it becomes cold, is put into three parts of highly rectified spirits, and the mixture well agitated in the still. By a very gentle heat, about two-thirds of perfectly pure alkohol will be procured.

On the human solids alkohol acts as a most violent corrugator and stimulus. It coagulates albumen, and has the same effect on all gelatinous fluids, and corrugates all the solids. Applied externally, it constringes the vessels, and thus may restrain hæmorrhage. It contracts the extremities of nerves, and deprives them of sense and motion; by this means easing pain, but at the same time destroying their use. Hence employing ardent

spirits in fomentations, notwithstanding the specious titles usually attributed to them, may sometimes be attended with injurious consequences. These liquors, when received undiluted into the stomach, produce the same effects, contracting all the solid parts which they touch, and destroying, at least for a time, their functions. If the quantity be considerable, a fatal palsy or apoplexy follows. Taken in small quantity, and diluted, they act as a cordial and tonic: if continued to excess the senses are disordered, voluntary motion destroyed, and at length the same inconveniences are brought on as in the other case. Vinous spirit, therefore, in small doses, and properly diluted, may be applied to useful purposes in the cure of diseases; whilst in larger ones it may produce great mischief.

The officinal preparations in which alkohol, pure or diluted, are numerous, and too well known to need repetition. The following, which is otherwise named *spiritus ammoniæ aromaticus*, forms an article in the Edinburgh New Dispensatory:

Alkohol Ammoniatum Aromaticum. Edin.

Take of Ammoniated alkohol, eight ounces;
Essential oil of rosemary, one drachm and a half;
Essential oil of lemon-peel, one drachm.
Shake them, so that the oils may be dissolved.

ALLANTOIS, or ALLANTOID MEMBRANE, (*membrana allantoidea;* from αλλας, a *hog's-pudding*, and ειδος, *likeness;* because in some brute animals it is long and thick); a membrane of the fœtus, peculiar to brutes, which contains the urine discharged from the bladder.

The *allantois* is not a general involucrum of the fœtus in the mother, for it covers only a small part of the amnios. It is mostly lodged in the cornua uteri. In mares, bitches, and cats, it surrounds the amnios, being every where interposed betwixt it and the chorion. In sheep and goats it is the same as in this animal; and in swine and rabbits it covers still less of the amnios. This sac is probably formed by the dilatation of the urachus, which is connected at its other end to the fundus of the bladder, through which it receives its contents; and a great quantity of urine is commonly found in it. The membrane is doubled at the extremity of the canal, to hinder the return of the urine back into the bladder. Its vessels are so excessively fine and few, that we cannot force an injected liquor farther than the beginning of this coat. This membrane is so far analogous to the cuticula, as not to be liable to corruption, or easily irritated by acrid liquors. Some assert, and others deny, the existence of this in the human species; but Dr. Hunter, in his lectures, absolutely denied the existence of this membrane, except in brutes, and later anatomists agree with him.

ALL-GOOD, the vulgar name for the *chenopodium bonus Henricus* Linn. A plant which may be used for spinach, and which is not inferior to it.

ALLIARIA, (from *allium*, garlick; from its smell like garlick); the herb called by the names *jack-by-the-hedge*, *sauce alone*, or *stinking hedge-mustard.* The plant to which this name is given in the pharmacopœias is the *erysimum alliaria; foliis cordatis* Linn. It is sometimes exhibited in asthmas with success. Its virtues are powerfully diaphoretic, diuretic, and antiscorbutic.

ALLIUM, (from *oleo*, to smell); garlick. It is the *allium sativum caule planifolio bulbifero, bulbo composito, staminibus tricuspidatis*, Linn. Class, *Hexandria.* Order, *Monogynia.* It is a native of Sicily; but as it is much used, both for culinary and medicinal purposes, it is cultivated in our gardens. All the parts of this plant, but more especially the roots, have a strong offensive, very penetrating, smell, and an acrimonious, almost caustic, taste. The root is full of a limpid juice, of which it yields almost a fourth part of its weight by expression. The root loses about half its weight by drying, but scarcely any of its smell or taste. By decoction its virtues are entirely destroyed; and by distillation it furnishes a small quantity of a yellowish essential oil, heavier than water, which possesses the sensible qualities of the garlic in an eminent degree. Its peculiar virtues are also in some degree extracted by vinegar, and by rectified spirit.

According to Neumann's analysis, it lost two-thirds of its weight by exsiccation. By decoction from 960 parts, water extracted 380, and the residuum yielded 27 to spirit, and was reduced to 40. Alkohol applied first, extracted 123, the residuum yielded 162 to water, and was reduced to 40. In both cases the extract made by spirit, was unctuous and tenacious, and precipitated metallic solutions. But the active ingredient was a thick ropy essential oil, according to Hagen, heavier than water, not amounting to more than 1.3 of the whole, in which alone resided the smell, taste, and other sensible properties remarkable in this vegetable.

If garlic be applied externally, it acts as a stimulant, rubefacient, and blister, successively. Internally, from its very powerful and diffusible stimulus, it is often useful in diseases of languid circulation and interrupted secretion. Hence, in leucophlegmatic habits, it proves a powerful expectorant, diuretic, and, if the patient be kept warm, sudorific. For the same reason, in cases in which a phlogistic diathesis, or other irritability prevails, large doses of it ought to be avoided.

Foreigners, and some of the lower classes, use it as a condiment, and it enters as an ingredient into many of the epicure's most favourite sauces. Taken in moderation, it promotes digestion; but in excess, it is apt to produce head-ach, flatulence,

thirst, febrile affections, and inflammatory diseases, and sometimes to occasion a discharge of blood from the hæmorrhoidal veins.

In typhous fever, and even in the plague, its virtues have been celebrated, with how much justice we know not. The root of garlic is with some a favourite remedy in intermittents; and it has been said to have sometimes succeeded in obstinate quartans, after the bark had failed. In catarrhal disorders of the breast; asthma, both pituitous and spasmodic; flatulent colics; hysterical and other diseases, proceeding from laxity of the solids, it has generally good effects: it has likewise been found serviceable in some hydropic cases. Sydenham relates, that he knew a dropsy to have been cured by the use of garlic alone; but he recommends it chiefly as a warm and strengthening medicine in the first attack of hydropical symptoms.

Some give it as an anthelmintic, and it has been frequently applied with success externally as a stimulant to indolent tumors, in cases of deafness proceeding from atony or rheumatism, and in retention of urine, arising from debility of the urinary organs.

This remedy may be either exhibited in substance, and in which way several cloves may be taken at a time, or else the cloves may be sliced and swallowed without chewing, which is the common mode of exhibiting it in many cases.

If the expressed juice be given, it must be rendered as palatable as possible by the addition of sugar and lemon juice. In deafness, cotton moistened with the juice is introduced within the ear, and the application renewed occasionally.

Infusions of garlic in proof spirit, wine, vinegar, or water, although containing the whole of its virtues, are so acrimonious, as to be unfit for general use; and yet an infusion of an ounce of bruised garlic in a pint of milk, was the mode in which Rosenstein exhibited it to children in worm cases.

But Dr. Andrew Duncan observes, that the most commodious form for administering garlic, is that of a pill or bolus conjoined with some suitable remedy in powder. In dropsy, calomel may sometimes be usefully exhibited along with it. Infusions of garlic are given as clysters.

Mixed into an ointment with oils, &c. and applied externally, it is said to resolve and discuss indolent tumours, and has been by some greatly esteemed in cutaneous diseases. It has likewise sometimes been employed as a repellent or discutient. When applied under the form of a poultice to the pubis, it has sometimes proved effectual in producing a discharge of urine, when retention has arisen from a want of due action in the kidneys or bladder. Sydenham assures us, that among all the substances which occasion a derivation or revulsion from the head, none operates more powerfully than garlic applied to the soles of the feet. He used it in the confluent small pox: about the eighth day, after the face began to swell: the root was cut in pieces, and tied, in a linen cloth, to the soles of the feet, and renewed daily till the patient was relieved.

ALLIUM CEPA; the systematic name for the *cepa*, or common *onion*. It is a perennial bulbous-rooted plant; the root being a simple bulb, formed of concentric circles. It possesses in general the same properties as garlic, but in a much weaker degree. Neumann extracted from 480 parts of the dry root, by means of alkohol, 360, and then by water 30; by water applied first 395, and then by alkohol, 30: the first residuum weighed 56, and the second 64. By distillation the whole flavour of the onions passed over, but no oil could be drawn from them.

These well known roots are considered rather as articles of food than of medicine. Though yielding little or no nourishment, when eaten liberally they produce flatulence, occasion thirst, headach, and turbulent dreams. In cold phlegmatic habits, where viscid mucus abounds, they doubtless have their use; as by their stimulating quality they tend to excite appetite, and promote the secretions. By some they are strongly recommended in suppressions of urine and in dropsies; but they are inferior to garlic. The chief medicinal use of onions in the present practice is in external applications, as a cataplasm for tumours which suppurate imperfectly, &c.

ALLIUM PORRUM; the systematic name for the *porrum* of the dispensatories. See Porrum.

ALLIUM SATIVUM; the systematic name for *Allium*. See Allium.

ALLIUM VICTORALIS; the systematic name of the *victoralis longa* of the pharmacopœias. See the article Victoralis

ALLOTRIOPHAGIA, (αλλοτριοφαγια; from αλλοτριος, *foreign*, and φαγω, to *eat*); a synonyme of *pica*. See Pica. In Vogel's nosology it signifies the greedily eating unusual things for food; a sort of depraved appetite.

ALLOY. By this word chemists and artificers commonly understand any portion of base metal, or metalic mixture, which is added to combine metals by fusion into one seemingly homogenous mass. Thus the gold coin of Britain is usually *alloyed* with copper, in order to prevent its wearing away in circulation.

ALLSPICE. See Pimento.

ALMONDS. See Amygdalæ.

ALMONDS OF THE EARS, a popular name for the tonsils, which have been so called from their resemblance to an almond in shape. See Tonsils.

ALNUS. (*alno*, Ital.); *the alder-tree*, of which botanical writers enumerate seven or eight species.

The sorts known in medicine are the following, but they are rarely used in the present practice.

1. *Alnus rotundifolia glutinosa viridis;* or the *common alder-tree*, called *amendanus*.

2. *Alnus nigra*, vel *frangula*, the *rhamnus frangula*, Linn. The *black alder*.

The common alder is tall and coniferous, grows in watery places, with little branches; its leaves are clammy, the bark is of a blackish brown, and the wood is reddish. All the parts of this tree are astringent and bitter, but the bark is the most astringent. A decoction of that has cured agues; and is also used for inflammatory affections in the throat, by way of gargle.

The *black*, or *berry-bearing alder*, is also found in moist woods. It is rather of the shrub kind. The inner yellow bark of the trunk, or root, given to ʒi. vomits, purges, and gripes; but, joined with aromatics, it operates more agreeably. An infusion, or decoction in water, inspissated to an extract, acts yet more mildly than these. The berries of this species of alder are purgative. They are not in use under their own name, but are often substituted for buckthorn berries; to discover which, it should be observed, that the berries of the black alder have a black skin, a blue juice, and two seeds in each of them; whereas the buckthorn berries have a green juice, and commonly four seeds.

ALOE, *(ahlah, growing near the sea; αλοη)*; quaintly called, by old writers on the Materia Medica, *fel naturæ*, from its extreme bitterness; a plant which affords the purging gum of the same name. All the species, of which botanists enumerate thirty-seven, have thick fat leaves, like those of the houseleek, but much larger, running two or three feet higher. An erroneous notion prevails, of the *aloe* plant blowing but once in a hundred years; but any skilful gardener will make these plants flower at any time, by setting them in a bed of tanner's bark. The best plants are said to grow in India, but all Asia produces them in fine order. They are commonly brought to us from warm climes, where they are produced, as the West Indies, &c. See Aloes.

ALOEDARIA, compound purging medicines; so called from having aloes as one ingredient.

ALOES, an inspissated gum of the whole plant described above. Of this gum we have three kinds in the shops.

1. Aloes Succotorina vel Zocotorina, *succotorine aloes.* It is reported that Alexander, landing on the island of Succotora, or Zocotria, at the mouth of the Red Sea, in one of his expeditions, took notice of the *aloe* plant, and from that it was brought into use, and called *succotorine*.

It is at least imported from the island Succotria, in the Indian ocean, wrapped in skins. It is obtained from the *aloe perfolia, foliis caulinis dentatis, amplexicaulibus vaginantibus, floribus pedunculatis cernius corymbosis subcylindricis.* Class, *Hexandria;* Order, *Monogynia* Linn. Gen. Pl. 430. The gum is bright on its surface, and of a reddish colour, with a purple cast; but when powdered, it is of a golden hue. It is hard and friable in very cold weather; but in summer it softens very easily betwixt the fingers. It is extremely bitter, and also accompanied with an aromatic flavour, but not so much as to cover its disagreeable taste. Its scent, though bitter, is rather agreeable, being somewhat similar to that of myrrh.

2. Aloes hepatica, vel Barbadensis; the common, or Barbadoes, or hepatic *aloes.* This is the *aloe perfoliata floribus pedunculatis cernuis corymbosis subcylindricis, vera, foliis spinosis confertis dentatis vaginantibus planis maculatis*, Linn. The best is brought from Barbadoes in large gourd-shells; an inferior sort in pots, and the worst in casks. It is darker coloured than the succotorine, and not so bright; it is also drier and more compact, though sometimes the sort in casks is soft and clammy. To the taste it is intensely bitter and nauseous, being almost totally without that aroma which is observed in the succotorine. To the smell it is strong and disagreeable.

3. Aloe caballina, vel Guineensis, *caballina vulgari similis sed tota maculata;* horse aloes. It is not easy to believe, as is generally reported, that this is only the more impure part of the Barbadoes aloes; because the difference does not consist in the purity, but in the quality. It is very distinguishable from both the others by its strong rank smell; in other respects it so far agrees with the Barbadoes species as to be often sold for it. Sometimes its purity and clearness are such, that we cannot distinguish it from the succotorine aloes; but either its offensive smell, or its want of the aromatic flavour, betrays it. These aloes have been chiefly employed by farriers.

The general nature of these three kinds is nearly the same. Their particular differences only consist in the different proportions of gum to their resin, and in their flavour. From their intense bitterness, they have received the name of nature's gall, as has been observed above.

Aloes consists of a small portion of resin, and a large one of gummy matter; to separate which, boil four ounces in a quart of water, until it is dissolved; let this solution stand in a cool place all night, by which time the resin will be deposited at the bottom of the vessel. The gum continuing in its dissolved state, by evaporation, is recovered in a solid form. Twelve ounces of the Barbadoes aloes yields nearly four ounces of resin, and eight of a gummy extract. The same quantity of the succotorine yields three ounces of resin, and nearly nine of gummy extract.

Aloes may also be purified by solution in water, and an evaporotion so immediately after, that the resin may not have time to settle. When the resin settles from the watery decoction, the impurities subside with it, and are to be separated by dissolv-

ing the resin in spirit of wine; then, after a due separation of the solution from its sediment, the resin is to be restored by evaporating the spirit with a gentle heat.

The resin of aloes has but very little scent; that from the Succotorine has very little taste. From the Barbadoes we perceive a slight bitter, and from the caballine somewhat more of the aloetic flavour.

The gummy extracts are less disagreeable than the crude aloes. That of the Barbadoes smells rather stronger than that of the Succotorine; but in taste it is less ungrateful. The Succotorine extract has very little smell, and is scarcely unpleasant to the taste; that of the caballine a rank smell, but a taste not worse than that of the Succotorine.

In the resinous part, it is said, consists the healing qualities of aloes as a topical remedy; hence those who condemn the disuse of the old *compound tincture of myrrh with aloes*, will agree that, for *external purposes* the Barbadoes is the best. *Internally*, however prepared, the resin of this has very little cathartic power. In the gummy extract resides the purgative, and all the other qualities. The gum of the Succotorine aloes purges more, and with greater irritation, than the gum of the Barbadoes: the former is therefore to be preferred where a stimulus is required, as when the menses are to be excited; the latter may be preferred for ruder purging. Of all the known purges exhibited in chronic maladies, this gum is supposed to be the most grateful to the stomach. Some are easily moved by it, others not. Sometimes it operates immediately, and its effects cease, as is common with other purges; and sometimes it produces no sensible effect with the first dose; but when it does answer, it continues the effect longer than any other purgative, keeping the body soluble during several days; and it does not induce a costiveness after its purging effects are over. Hence it is good in costive habits. *In small doses*, long continued, it occasions considerable irritation about the anus, and sometimes a discharge from the hæmorrhoidal vessels. Hence it is considered an excellent remedy, in cases where, to relieve nervous disorders, we would promote such an evacuation. When this effect is not produced by small doses, they cleanse the first passages, warm the system, and promote the secretions. When hypochondriac affections disturb the feeble and sedentary, this drug is peculiarly proper. Cachectic habits, and persons labouring under oppressions in the stomach from viscid crudities, caused by irregularity, are particularly relieved by it. *It is powerfully antiseptic*, and, in common with bitters and purgatives, is an *anthelmintic*. In all diseases of the bilious tribe, aloes is the strongest purge; and the best preparations for this purpose are the pilulæ ex aloe cum myrrhâ, the tinct. aloës, or extractum colocynthidis comp. Its efficacy in the jaundice is very considerable, as it proves a succedaneum to the bile, which in that disease is defective either in quantity or quality.

Aloes purges in flatulent cold habits where there is no inflammation; but when the blood is inflamed, the belly very costive, and the urine high-coloured, it produces no such effect: on the contrary, the oftener this medecine is repeated in this latter habit of body, the more astringent it will prove. *In hot, febrile constitutions* therefore, it is injurious by heating the blood, and inflaming the bowels. In habits disposed to the gravel, as well as during the passage of calculi from the kidnies, through the ureter, aloetic purges are improper. *Aloes* seems only to act on the large intestines, and produce in moderate doses one or two copious evacuations of alvine contents; and that without pain or inconvenience. Yet it seldom produces liquid stools in a less dose than from five to ten or fifteen grains, and then it will gripe, sometimes severely.

The dose of crude *aloes*, or of the gummy extract, may be from gr. v. to gr. x. Mineral or vegetable alkali lessens the purgative quality of *aloes*: and long boiling quite destroys it. Accompanied with heat, crude *aloes* may be all disolved in water; but when this solution is cold, it lets fall its resin. A mixture consisting of pure water two parts, and proof spirit one part, perfectly dissolves it without heat; but rectified spirit of wine dissolves it most speedily. If water or wine be the menstruum, the *aloes* becomes tenacious, and dissolves slowly; in this case, white sand should be well mixed with the powdered *aloes*, before it is added to these last mentioned fluids.

Aromatics correct the offensive qualities of *aloes* the most perfectly. The canella alba answers tolerably, and without any inconvenience: but some rather prefer the essential oils for this purpose.

Dr. Cullen says, "if any medicine be entitled to the appellation of a *stomach purge*, it is certainly Aloes. It is remarkable with regard to it, that it operates almost to as good purpose in a small as in a large dose; that five grains will produce one considerable dejection, and twenty grains will do no more, except it be, that, in this last dose, the operation will be attended with gripes, &c. Its chief use is to render the peristaltic motion regular, and it is one of the best cures of habitual costiveness. There is a difficulty we meet with in the exhibition of purgatives, *viz.* that they will not act but in their full dose, and will not produce half their effect if given in half the dose. For this purpose we are chiefly confined to Aloes. Neutral Salts in half their dose will not have half their effect, although even from these, by large dilution, we may obtain this property; but besides them, and our present medicine, I know no other which has any title to it, except Sulphur. Aloes some-

times cannot be employed. It has the effect of stimulating the rectum more than other purges, and with justice has been accused of exciting hæmorrhoidal swellings, so that we ought to abstain from it in such cases, except when we want to promote them. Aloes has the effect of rarifying the blood, and disposing to hæmorrhagy, and hence it is not recommended in uterine fluxes. Fœtid gums are of the same nature in producing hæmorrhagy, and perhaps this is the foundation of their emenagogue power."

Aloes is administered either simply in powder, which is too nauseous, or else in composition:

1. With purgatives; as soap, scammony, colocynth, or rhubarb.
2. With aromatics; as canella, ginger, or essential oils.
3. With bitters; as gentian.
4. With emenagogues; as iron, myrrh, wine, &c.

It may be exhibited in pills, as the most convenient form; or else dissolved in wine or diluted alkohol.

The officinal preparations of Aloes are the following: Pulv. cum canella, *Lond.*—cum Guaiaco, *Lond.*—cum ferro, *Lond.*—Scam. comp. cum aloe, *Lond.*—Pilulae, *Edin. Lond. Dub.*—cum assa fœt. *Edin.*—cum colocynth. *Edin.*—cum myrrha, *Lond. Edin.*—Pil. rhæi comp. *Edin.*—Extract. *Dub.*—Extract. coloc. comp. *Lond.*—Tinct. *Edin. Lond. Dub.*—cum myrrha, *Edin.*—Tinct. benz. comp. *Lond. Edin.*—T. rhei cum, Alo. *Edin.*—Tin. Alo. æther, *Edin.*—Vinum Aloes, *Edin. Lond. Dub. Pharm.* Of these we shall set down the following:

Pilulæ Aloeticæ. Edin.

Take of Aloes, in powder,
Soap, equal parts of each.
Form them with syrup into a mass for pills.

Pilulæ Aloeticæ. Dubl.

Take of Barbadoes aloes, one ounce;
Extract of gentian, half an ounce;
Ginger, in powder, two drachms.
Beat them together, and form a mass with the jelly of soap.

Pilulæ Aloes Compositæ. Lond.

Take of Socotorine aloes, powdered, one ounce;
Extract of gentian, half an ounce;
Oil of caraway seeds, two scruples;
Syrup of ginger, a sufficient quantity.
Beat them together into a mass.

Soap probably facilitates the solution of the aloes in the stomach, as was supposed by Boerhaave; and it is probably the most convenient substance that can be added to give it the proper consistence for making pills. When extract of gentian is triturated with aloes, they become too soft to form pills, unless at the same time some powder be added to give it consistency, as directed by the Dublin College.

Pilulæ Aloes cum Assa Fœtida. Edin.

Take of Socotorine aloes,
Assa fœtida,
Soap, equal parts of each.
Form them into a mass with mucilage of gum arabic.

About ten grains of this mass, given twice a-day, produce good effects in dyspepsia, attended with flatulence and costiveness.

Pilulæ Aloes cum Colocynthide. Edin.

Take of Socotorine aloes,
Scammony, of each eight ounces;
Colocynth, four ounces;
Oil of cloves,
Sulphate of potass with sulphur, of each one ounce.
Powder the aloes and scammony, with the salt; then add the colocynth, beaten into a very fine powder, and the oil, making all into a proper mass with mucilage of gum arabic.

In this composition we have a very useful and active purgative, in cases where the simple aloetic pill is not sufficient for obviating costiveness. Little of its activity can depend upon the salt which enters the composition. These pills often produce a copious discharge in cases of obstinate costiveness, when taken to the extent only of five or ten grains; but they may be employed in much larger doses. They are, however, seldom used with this view. Half a drachm of the mass contains about five grains of the colocynth, ten of the aloes, and ten of scammony.

Pilulæ Aloes cum Myrrha. Lond.

Take of Socotorine aloes, two ounces;
Myrrh,
Saffron, of each one ounce;
Syrup of saffron, as much as is sufficient.
Powder the gums separately; and afterwards beat all together into a mass.

Pilulæ Aloes cum Myrrha. Edin.

Take of Socotorine aloes, two ounces;
Myrrh, one ounce;
Saffron, half an ounce.
Beat them into a mass with a proper quantity of simple syrup.

These pills, formerly named *Pilulæ Ruffi*, have long continued in practice, without any other alter-

ation than in the syrup with which the mass is made up, and in the proportion of saffron. The virtues of this medicine may be easily understood from its ingredients. Given to the quantity of half a drachm or two scruples, they prove considerably cathartic, but they answer much better purposes in smaller doses as laxatives or alteratives. The saffron in either of these compositions cannot be considered as a material article.

The liquid preparations of Aloes, are the following:

Tinctura Aloes Socotorinæ. Edin.

Take of Socotorine aloes, in powder, half an ounce;
Extract of liquorice, an ounce and a half;
Alkohol, four ounces;
Water, one pound.
Digest these for seven days, or till their solution be effected, in a closed vessel, with a gentle heat, and frequent agitation.
This is the *Tinctura Aloes* of the Dublin Pharmacopœia.

Tinctura Aloes. Lond.

Take of Socotorine aloes, in powder, half an ounce;
Extract of liquorice, an ounce and a half;
Distilled water,
Proof spirit, of each eight ounces by measure.
Digest in a sand bath, shaking the vessel occasionally, until the extract be dissolved, and then strain.

The Dublin college use the same proportion with that of Edinburgh; and they direct the extract of liquorice to be softened in hot water, which facilitates its solution. The London college order the fluids by measure; and sixteen ounces by measure are only equal to fourteen and a half by weight. It may be justly observed of this simple tincture, that all the active parts of the aloes are suspended in the menstruum. The extract of liquorice serves to cover the taste of the aloes; and in cases where we wish for the operation of the aloes alone, this is perhaps one of the best of the liquid formulæ. About an ounce is given for a dose.

Tinctura Aloes cum Myrrha. Edin.

Take of Myrrh, in powder, two ounces;
Alkohol, one pound and a half;
Water, half a pound.
Mix the alkohol with the water, then add the myrrh.
Digest these for four days; and lastly, add
Socotorine aloes, one ounce and a half;
Saffron, one ounce.
Digest the whole again for three or four days, and lastly, pour off the tincture for use.

Tinctura Aloes Composita. Lond.

Take of Socotorine aloes,
Saffron, of each three ounces;
Tincture of myrrh, two pints.
Digest them for eight days, and strain off the tincture.

This is given as an improvement on the old *elixir proprietatis*, a medicine, in its original form, of considerable efficacy.

Of the above aloetic formulæ, it is to be observed, that the proportion of aloes in some of them is much greater than in others; and this must be allowed for in prescription.

ALOES LIGNUM. See Lignum Aloes.

ALOPE'CIA, (from αλωπηξ, a *fox*); BALDNESS, *depilation*, the falling off of the hair, because the fox is said to be subject to a complaint that resembles it: called also, by ancient writers, *capillorum defluvium*, *athrix*, *phalacrotis*; when particularly on the sinciput, *calvities*, and *calvitium*; which Galen says is owing to a defect of moisture. When the bald part is smooth and winding, like the track of a serpent, it is called *ophiasis*; but the most general name for all the different appearances of bald parts is *area*, from the area in a garden, a spot on which not any thing grows; though Blanchard says, that the hair falls off *areàtim*, by *shedding*.

Baldness, as a disease, seems to have been more common among the ancients than in our days. Celsus says, that the *alopecia* comes at any age, but the *ophiasis* only affects infants; and Sennertus observes, that they both are common to all ages, though they are most frequently met with in childhood, and often succeed the *tinea*, *achores*, and *favi*.

The cause is either a morbid action of the vessels of the skin that destroys the roots of the hair, in which case the hair turns white, yellow, &c. and there is a degree of cutaneous irritation which manifests the existence of diseased action; or else there is a want of activity in the vessels which nourish the roots, in which case the hair falls off without any change in its colour or texture.

As the ancients describe the *alopecia*, it spreads itself on the beard, as well as on the hairy scalp, and is irregularly formed. The *ophiasis* usually begins at the back part of the head, and creeps about the breadth of two fingers, till it has extended itself to both the ears, and sometimes to the forehead, till both parts meet in one. The *ophiasis* is described as more malignant than the *alopecia*, since in the former, the roots of the hair, and also the cuticle, as far as the roots reach, is corroded; the skin changes its colour, being sometimes pale, at others, of a dark colour; and, if pricked, a serous blood issues out.

Though, in infants, these disorders commonly go off as age advances, yet in adults, the cure, especially of the *ophiasis*, is very difficult. If the part does not grow red with friction, it is said, a cure is vainly attempted; but in proportion as a redness appears readily on rubbing the part, the cure may be expected to be easy or otherwise.

As to the cure, if any other disease attends, begin by removing it, which done, it often falls out that the *alopecia*, &c. depending thereon, is itself removed. Before the hair falls off, by way of prevention, camphorated or volatile spirits, or some other stimulants and astringents may be tried; but if the disease is formed, these must be omitted. The head must be shaved, then washed with alkaline ley (in which the ancients infused the abrotanum and such like herbs), after which, the part should be rubbed with a flannel or coarse cloth till the skin becomes red. This done, applications of mustard, white lily roots, tar, sulphur or white hellebore may be directed, according to the prescriber's intention. Some of the corrosive mercurials may also be proper, such as red or white precipitate, *ung. hydrarg. nitrati*, &c.

AL'OSA, (from αλισκω, *to take*, because it is a ravenous fish), SHAD; a species of *clupea*. A sea-fish nearly the size of a salmon, with large scales, but thin and easily taken off. In its head is a calcareous substance of an alkaline nature. This fish is the best for eating in spring, but if pickled it will keep well all the year. Writers on the materia medica represent it as forming that sort of diet termed *restorative*.

ALPHENIC, (ALPHANAC—*tender*. Arab.); an Arabian word for sugar-candy, or barley-sugar; so called from its frangibility.

A'LPHITA, the plural of αλφιτον, (from αλφος, *white*); the meal of barley that has been hulled and parched. Hippocrates uses this word for meal in general. Galen says, that κριμνα is coarse; αλευρα, fine; and αλφιδα, middling sort of meal.

ALPHITIDON, (from αλφιτον, *meal*). The old writers used this term when speaking of a bone that was broken in small fragments like *alphita*, i. e. *bran*. They used the words *caryedon*, and *catagma*, when the fragments were like a broken nut.

A'LPHITON, HASTY-PUDDING. Thus the Greeks call it, but the Roman name is *polenta*: it is made, of barley-meal, moistened with water, wine, mum, or any other liquor. Their soldiers had it in common use.

A'LPHUS, (αλφος, from αλφαινω, an old word signifying *to change*), because it changes the colour of the skin; a variety of that sort of white leprosy called, by the ancients, *vitiligo*, and which they divided into the *alphus*, *melas*, and *leuce*. In the *alphus* the skin is white and rough, not all over, but in spots: sometimes the patches are broad. It has the same origin as the lepra, and bears the same analogy to the leuce as the scabies does to lepra. The first is superficial, chiefly affecting the skin; the second sinks deeper into the flesh: but these, in fact, are all disorders that only differ in their degrees of inveteracy. See LEPRA.

Vitiligo alba; Morphœa alba; Lepra maculosa alba; are other names by which the old writers describe this species of leprosy, in which white spots appear upon the skin. It is said, by different travellers, to have been produced by a peculiar miasma, which is endemial to Arabia. Severinus calls it *Baras*.

ALSINE MEDIA, (from αλσος, a *grove*); the systematic name for a plant, called *chickweed*, and *mouse-ear*, which, if boiled tender, may be eaten like spinage, and forms also an excellent emollient poultice.

There are twenty-two species described by botanists. It is a small creeping herb, and too generally known to need a description: in shady cultivated ground it is to be met with the greatest part the year, but it grows also in more exposed places, where it appears in the middle of winter, and dies in the middle of summer. It is used to promote an appetite in linnets and Canary-birds. Alsine is also a name given to a species of faxifraga, or whitloe-grass. See PARONYCHIA.

ALTERA'NTIA, (from *altero*, *to* change); *alteratives*, a class of medicines which are supposed to make a change in the system, from a morbid to a sound state, without any manifest operation or evacuation. The term is also employed for medicines given with a view to clear the blood from certain impurities supposed to exist in it. Whatever other general operations may be proper to any medicines, all of them may be used as alteratives. The most powerful are evacuants, given in diminished doses, and repeated at proper intervals. By administering them thus, or mixed with other remedies as the case may indicate, they may eventually do good. Though the discharge they promote, is not increased, they pass into the blood, and the secretions are stimulated, by which a general change in the system is produced. Dr. Cullen, however, expresses strong doubts, as to the validity of these conclusions.

ALTERATIVES, (*alterantia*, sc. *medicamenta*; from *altero*, to *change*). Those remedies are so called, which are given with a view to re-establish the healthy functions of the animal œconomy, without any sensible evacuation. See ALTERANTIA.

ALTERNATE, (*alternatus*, from *alter*, another); a term in botany, meaning not opposite to each other, but first one, and then another, as is often seen in the leaves of plants.

ALTHÆ'A, (from αλθεω, *to heal*, from its supposed sanative qualities), MARSHMALLOW; the ALTHEA OFFICINALIS *foliis simplicibus tomentosis*

Linn. Class, *Monadelphia;* Order, *Polyandria.* Gen. Plant. 839.

It is a soft hoary plant, with oblong undivided leaves, and pale flesh-coloured monopetalous flowers cut deeply, in five sections, set in a double cup, the outermost of which is divided into nine parts, the inner into five; the fruit consists of a number of capsules set in form of a flat disk, containing each a single seed; the roots are long and slender, with several fibres, of a pale yellowish colour on the outside, and white within. It grows wild in marshes and other moist places in England, though it is frequently cultivated in gardens. It is perennial, and flowers from June to near the end of summer.

All the parts of this plant abound with a mucilaginous matter, almost both inodorous and insipid. The dry roots, if boiled in water, give out near half their weight of gummy matter, which in evaporating, the aqueous fluid forms a flavourless yellowish mucilage; the leaves afford nearly one-fourth of their weight, the flowers and seeds still less.

All its virtues depend on its soft mucilage. In consequence of this quality it is recommended as a demulcent and emollient, in cases where the mucous membrane becomes abraded, or the secretion acrimonious. It moderates tickling coughs which proceed from defluxions on the fauces and lungs, gives relief in hoarsenesses, soreness of the chest and intestines, dysentry, and difficulty and heat of urine. It relaxes the passages in nephritic complaints; in which last case, a decoction is the best preparation. Two or three ounces of the fresh roots may be boiled in a sufficient quantity of water to a quart, to which one ounce of gum arabic may be added. Nitre is sometimes added; but, there is reason to think, improperly, as it passes into the urine and augments its stimulating qualities. The following is given, where it is required that large quantities should be used. An ounce of the dried root is to be boiled in water enough to leave two or three pints to be poured off for use; if more of the root be used, the liquor will be disagreeably slimy. If sweetened by adding a little of the root of liquorice, it will be very palatable. Some prefer the infusion, as long boiling destroys part of the viscidity of this plant.

The London and Edinburgh Colleges give the following officinal preparations of Althæa:

Decoctum Althææ Officinalis. Edin.

Take of Dried marshmallow roots, four ounces;
Raisins of the sun, stoned, two ounces;
Water, seven pounds.
Boil them to five pounds, and strain the liquor. When the feces have subsided, pour off the clear decoction for use.

In these roots there is nothing soluble in water except mucilage, which is very abundant in them. This decoction is rendered more pleasant by the addition of the raisins.

Syrupus Althææ Officinalis. Edin.

Take of Marshmallow roots, one pound;
Water, ten pounds;
Double refined sugar, four pounds.
Boil the water with the roots to the consumption of one half; strain the liquor, and to the depurated part add the sugar: then boil so as to make a syrup.

Syrupus Althææ. Lond.

Take of Marshmallow roots, bruised, one pound;
Double refined sugar, four pounds;
Water, one gallon.
Boil the water with the roots to one half; press out the liquor, and proceed as in the former case.

Dr. Cullen in his lectures on the Materia Medica, includes Althæa in the *natural* order *Columniferæ*, the individuals of which, he says, as far as they have been exposed to examination, all agree in being bland and mucilaginous. The most powerful kind we know, are the roots of *Althæa*, which afford a mucilage of very great use as a *demulcent.* Externalty it may be of some use as an *emollient*, but as it is commonly so much diluted with water, the emollient effects of it are chiefly to be imputed to that.

Whether as emollient and demulcent, the root should not be employed as recently dug up, nor, at the same time, too much dried. In the one case it is too much diluted with water, in the other the mucilage is not easily extracted, so that an intermediate state, between both these, is to be chosen, which, very likely, is seldom the case in the shops. *Althæa* root might be prepared in the same manner as Salep, and, in a powder of that kind, it would yield its mucilage much more easily.

The *malva* has nearly the same qualities, but inferior in degree. This is the case with many other species of the *althæa.* The leaves of some of them are boiled as fomentations. For internal use, it is said, the *great comfrey* root is preferable, in most cases, to the *althæa.*

ALTHÆA OFFICINALIS, the systematic name for the *Althæa* of the shops. See ALTHÆA.

ALTHÆA THEOPHR'ASTI FLORE LU'TEO; called also *Althæa Indica, ibiscus Theophrasti, abutilon,* and in English the YELLOW MARSHMALLOW. This plant is cultivated in gardens, and flowers in July. Its appearance, except in the colour of the flowers; and its medical virtues, are similar to the other spe-

cies. Miller enumerates sixteen species of this yellow flowered kind.

ALUDEL, a hollow sphere of earthenware, having a short neck projecting at each end, by means of which one globe may be set upon the other. The uppermost has no opening at the top. They were used, in former times, for the sublimation of several substances. Cullen speaks of the sublimation of antimony "in *aludels* joined to each other," so as to form "*flores antimonii.*"

ALUM. See Alumen.

ALUMEN, (*alum*, Arab), alum. The substance directed in the pharmacopœias by this name is called, in the new chemical nomenclature, *sulphas aluminæ acidulus cum potassa*, and *argilla vitriolata*, by Bergman; *Sulphate of Alumine*, or Alum. See Alumine.

Although alum be very commonly met with, the combination of principles which constitute it, is not effected without considerable difficulty. The pure clay, upon which the sulphuric acid is digested, is dissolved with difficulty; and it is by no means easy to bring this combination to regular crystals. The usual product is a salt, which appears to be formed by scales applied one upon the other. The sulphate of alumine is prepared by a variety of processes, according to the country where it is manufactured, and the materials from which it is obtained. But the most common process to dissolve alumine by means of an acid, consists in calcining the clay, impregnating it with the acid, and facilitating its action by a heat of from 145 to 167 degrees of Fahrenheit. Professor Chaptal has however adopted a method, in his manufactory of alum, which appears to be more simple and convenient: it consists in presenting the acid in vapours, and under the dry form, to the clay properly prepared. For this purpose he calcines his clays, and reduces them into small pieces, which he spreads over the floors of leaden chambers. The sulphuric acid, which is formed by the combustion of a mixture of sulphur and saltpetre, expands itself in the cavity of these chambers, and exists for a certain time in the vaporous state. In this form it has a stronger action than when it has been weakened by the mixture of a quantity of water more or less considerable: so that it seizes the earths, combines with them, causes them to increase in bulk by the efflorescence which takes place, and at the end of several days the whole surface exposed to the vapour is converted into alum. Care must be taken to stir these earths from time to time, that they successively present all their surfaces to the action of the acid. But whatever process may be used to combine the acid with clay, it is necessary to expose the aluminized earths to the air during a greater or less space of time, in order that the combination may be more accurate, and the situation more complete. Almost all the alum employed in commerce is afforded by ores which are dug out of the earth for this purpose. All the operations of this manufacture may be reduced to four; the decomposition of the ore; the lixiviation of the ore; the evaporation of the lixivia; and the crystallization of the alum. The decomposition of the mineral is effected either in the open air without assistance, or else by means of fire. When the mineral is left to decompose spontaneously, nothing is more necessary than to dispose the stone which contains the principles of alum in strata or layers. The pyrites becomes heated; acid is formed, which dissolves the clay; and the salt arising from this combination exhibits itself by the efflorescence of the ore. The decomposition may be accelerated by watering the heap of pyrites; and the operation may be still more abridged by the assistance of fire. The method of applying the heat however varies very much. It ought not in general to be either too strong or too weak. In the first case it volatilizes the sulphur, and in the second it retards the operation. The ore of alum is sometimes found impregnated with a sufficient quantity of bitumen to maintain the combustion.

In cases where the ore has effloresced into alum, the salt is extracted by lixiviation. For this purpose the same water is passed over several heaps of aluminous earth, in order to saturate it. The water which is first passed over the earth dissolves in preference the *vitriol*, which is more or less abundant; and this salt may be separated from the alum by a previous cold washing. This lixivium, or saline solution, is carried into leaden caldrons, where the fluid is properly concentrated. In this part of the process it is that an accurate saturation of the alum is effected when the acid is in excess; and for this purpose alkalis are added, which serve likewise singularly to facilitate the crystallization. It has been proposed by Professor Bergmann to boil clay with the solution, to saturate the excess of acid. This process would seem in every point of view advantageous; but Mr. Chaptal thinks it impracticable, because the superabundant acid cannot be made to combine with the clay but by a very long ebullition; and he has remarked, that, by afterwards evaporating the fluid to cause it to crystallize, this clay falls down, and opposes the crystallization. This ingenious chemist varied the process in different ways, without obtaining the success which its celebrated author predicted. There are methods of greater or less accuracy to judge of the degree of concentration to which it is proper to carry the lixivium, in order to obtain a good crystallization; such as, the immersion of an egg in the liquid, the effusion of some drops of the lixivium on a plate, &c. Mr. De Morveau has proposed a metallic hygrometer; but this instrument cannot be considered as very accurate,

because its immersion in the liquid is proportional to the heat of the fluid in which it is plunged.

In the next place the lixivium is conveyed in coolers, where it crystallizes by mere refrigeration. The pyramids of alum are constantly turned towards the bottom of the vessel, more especially those which fix themselves to the sticks which are put into the liquor to multiply the surfaces. Alum affects the form of two tetrahedral pyramids, applied to each other base to base. Sometimes the angles are truncated, and these truncatures take place most frequently when the lixivium is too slightly acid. According to the experiments of Mr. Kirwan, this salt requires fifteen times its weight of water to dissolve it, at the temperature of 60 degrees of Fahrenheit. Its taste is styptic: it loses its water of crystallization by heat; at the same time that it swells up, and is converted into a light and white substance, called *burned* or *calcined alum.* If it be urged by a violent degree of heat, it loses part of its acid, and becomes tasteless. The residue is no longer susceptible of crystallization, and precipitates in the form of a very fine adhesive powder, in proportion as the water is dispersed by evaporation. From this solution alumine is precipitated by magnesia, barytes, and the alkalis: these last dissolve the precipitate in proportion as it is formed, if they be added in excess.

The following kinds of alum are met with in the shops:

1. *Ice or rock alum.* This is always in very large transparent masses, and derives its name from Rocca, in Syria, now called Edessa, in which the earliest manufactory of this salt was established. This species is not very pure.

2. *Roman alum*, which is prepared in the territory of Civita-Vecchia. This species comes in lumps of the size of eggs, covered with a reddish efflorescence.

Alum, when first tasted, imparts a kind of sweetness, but is soon felt to be strongly astringent. On account of this virtue it is of very extensive use both in medicine and surgery. Internally it is used as an astringent, to restrain uterine hæmorrhages, and check the *fluor albus*; but though, in these sort of fluxes it is highly commended, it is rarely, and with great caution, to be employed in dysenteries, particularly in the beginning of them. Though powerful as an astringent in such cases, it is recommended by Dr. Percival, in the *colica pictonum* and other painful disorders of the bowels, attended with obstinate constipation. See Percival's Essays Med. and Exp. vol. ii. The dose advised in these cases is from five to twenty grains, to be repeated every four, eight, or twelve hours. When duly persisted in, this remedy proves gently laxative, mitigates the pain, abates flatulence, mends the appetite, and strengthens the organs of digestion. *Alum* is powerfully tonic, and it is not unreasonably supposed to contribute to the relief of pain in the intestines, by blunting the morbid sensibility of their nerves. As the mineral acids do, it coagulates the blood and juices. In robust habits, after purging with calomel, it cures agues. Dr. Cullen thinks it ought to be employed with other astringents in diarrhœas. "In active hæmorrhages it is not useful, though a powerful medicine in those which are passive. It should be given in small doses, and gradually increased. It has been tried in the diabetes without success; though, joined with nutmeg, it has been more successful in intermittents, given in a large dose, an hour, or a little longer, before the approach of the paroxysm. In gargles, in relaxations of the uvula, and other swelling of the mucous membrane of the fauces, divested of acute inflammation, it has been used, and advantageously; also in every state of the cynanche tonsilaris.—It is also preferable to white vitriol, or acetated ceruse, in the ophthalmia membranarum. From two to five grains dissolved in an ounce of rose water" forms a proper Collyrium.

The officinal preparations of Alum are these: *Alumen purificat.* Lond. *Sulph. Alum. exsicc.* Edin. Lond. Dubl. *Solut. Sulphat. cupri comp.* Edin. *Aq. Alumin. comp.* Lond. *Pulv. Alum. comp.* Edin. *Cataplasm. Alum.* Lond. Dubl. and Pharm. Chir.

Aluminis Purificatio. Lond.

Take of Alum, one pound;
Chalk, one drachm;
Distilled water, one pint.
Boil them a little, strain, and set the liquor to crystallize.

It has been properly objected to this process, that the addition of chalk is improper, as its only effect will be to decompose part of the alum.

Sulphas Aluminis Exsiccatus. Edin.

Melt alum in an earthen or iron vessel, and keep it over the fire until it cease to boil.

This forms the well known substance called *burnt alum*, which is otherwise ordered thus:

Alumen Ustum. Lond. Dub.

Take of Alum, half a pound.
Burn it in an earthen vessel as long as it boils.

Chaptal, by exsiccation of alum made for the experiment, in a red heat, lost 0.67; Roman alum 0.50; English alum 0.47, and Levant alum only 0.40. These differences arise principally from different proportions of water of crystallization, but also form an excess of alumine, which exists in the last.

Mr. Kirwan found crystallized alum to consist of 17.66 acid, 12. alumine, and 70.24 water, and

alum desiccated at 700° of 36.25 acid, and 63.75 basis, by which it would appear that at that heat it loses not only all its water, but also more than half its sulphuric acid.

Burnt alum is applied as a gentle escharotic to fungous ulcers.

In the Dublin Pharmacopœia we find *coagulum aluminosum*, prepared in the same manner as the

Cataplasma Aluminis. Dub.

Take the whites of two eggs.
Shake them with a piece of alum till they be coagulated.

This application, which is taken from Riverius, is a useful astringent epithem for sore and moist eyes. After the inflammation has yielded a little to bleeding, this preparation is one of the best external remedies. It is to be spread on linen rag and applied at bed time.

Alum is also extensively useful in the arts and manufactures; and is applied to many purposes of life. In this country, bakers mix a quantity of it with their bread, to render it white. This mixture renders the bread better for weak and relaxed bowels; but in opposite states of the alimentary canal, the practice is highly pernicious.

ALUMEN USTUM, burnt alum. See ALUMEN.

ALUMINE, OR ALUMIN; pure clay, or earth of alum. This kind of earth is not exempt from mixture and adventitious combination; therefore, in order to obtain it in a state of purity, the sulphate of alumine (i. e. alum) is dissolved in water, and decomposed by effervescent alkalis. Pure clay seizes water with avidity, and may then be kneaded. It combines readily with most acids, dries in flakes, and adheres strongly to the tongue. Its specific gravity does not exceed 2.000. When exposed to heat, it dries, contracts, shrinks, and becomes full of cracks. A considerable degree of heat renders it so hard that it gives fire with steel. After having been well baked, it is no longer capable of uniting with water; but requires to be dissolved in an acid, and precipitated, in order that it may resume this property. The experiments of Mr. Lavoisier shew, that pure alumine is capable of an imperfect fusion, approaching to the consistence of paste, by heat excited by a current of oxygen. It is then transformed into a kind of very hard stone, which cuts glass like the precious stones, and which very difficultly yields to the file. The mixture of chalk singularly assists the fusion of this earth; and, according to Mr. Gerhard, it is susible in a crucible of chalk, but not in a crucible of clay. Mr. Kirwan and the abbé Mongez have shewn that the borate of soda, and the phosphates of lime, dissolve it. From the experiments of Mr. Dorthes, it appears that the purest native clays, and even that which is precipitated from alum, contain a small quantity of iron in the state of oxide; and that it is from this principle that the earthy smell which is emitted by moistened clays, arises: it is extremely difficult to deprive them of this.

It is generally known that the substance, which, in the arts, is distinguished by the name *clay*, is a natural mixture of several earths. Alumine, or pure clay, is capable of combining with the greater part of the known acids; but the most known of the salts formed in this way is that which is called alum. See ALUMEN.

The argillaceous earth precipitated from the solution of alum by the carbonates of alkalis, combines with their acid; but this salt is very rarely found in nature. Schreber has, however, asserted, that the earth known by the name of *lac lunæ* is a true *carbonate of alumine.* Although alumine be soluble in the other acids, we are very little acquainted with its combinations. It is only known that the nitric acid dissolves it, that the solution is astringent, and that it may be obtained in small styptic and deliquescent crystals. The muriatic acid has a more evident action upon alumine. This muriate is gelatinous and deliquescent. These salts have not hitherto been applied to any particular purpose, nor have they been any where found in nature.

ALVEARIUM, (from *alveare*, a *bee-hive)*; that part of the meatus auditorius externus which contains the wax of the ear in the human subject.

ALVE'OLI, (a dim. of *alveus*, a *channel)*; the sockets of the jaws in which the human teeth are set. They are lined with a very sensible membrane, which also incloses the roots of the teeth. There are usually sixteen of these *alveoli* or sockets in each jaw. See TEETH.

ALVEUS COMMUNIS; the common duct or medium of communication of the ampullæ of the membranaceous semi-circular canals, is so termed by Scarpa and other writers.

ALVIDU'CA, (from *alvus*, *the belly*, and *duco*, to draw); a term applied to medicines which act as purges. See PURGANTIA.

AL'VI'FLU'XUS, (from *alvus*, and *fluo*, to flow). See DIARRHŒA.

ALVUS, the belly. See ABDOMEN. This term is now applied to the state of the intestinal canal; thus, when the bowels are relaxed, it is called *alvus liquida*; and, when very costive, *alvus adstricta.*

ALYSMOS, (from αλυσμος, *uneasiness*, or *anxiety)*. Hippocrates uses this term to express that uneasiness that is attendant on acute diseases, which makes patients toss about, and prevents their resting long in the same posture. Duretus distinguishes between the αλυσμος ανεμετος, and the αλυσμος ναυτιδης. The first is caused by an oppression of the vital powers, the latter by sickness

in the stomach; but of this *alysmos* (i. e. *anxiety*) there are reckoned four sorts; two with, and two without fever.

1. Without fever, from something uneasy in the stomach. Uneasiness of the stomach by sympathy, as from a stone in the kidneys, &c. produces this disorder.

2. Without fever, from vapours or spasm in the stomach, or other viscera of the belly.

3. With fever, from a difficulty of the blood passing through the lungs.

4. With fever, from a stricture of the vena portæ.

AMA'LGAM *(amalgama*, from αμα, *simul*, and γαμαω, *nubere*, vel μαλαττω, *mollire)*; in chemistry, is a substance produced by mixing mercury with a metal, the two being thereby incorporated.

Most of the metals may be amalgamated with mercury, except iron. Gold amalgamates the most readily of any of them, silver next, lead and tin next, copper with difficulty, and iron scarcely at all. To amalgamate a metal then, is to reduce it to a paste by uniting it with quicksilver: with this paste, silver and other metals are gilt. The following methods are directed for this process in different cases:

1. *Amalgam of* Gold.—Dissolve pure gold in aqua regia, till the liquor is saturated; dilute the solution with twelve times its quantity of distilled water; put into it some polished plates of copper, and the gold will be precipitated upon them. Place the mixture in a due degree of heat until the liquid is no longer turbid by the addition of copper. Then shake the plates, that all the gold may fall to the bottom; pour off the liquor, wash the precipitated powder with water, dry it, and in a glass mortar, reduce it to an amalgam with quicksilver. After the amalgam is once formed, it will receive more and more quicksilver, at the pleasure of the operator.

By these processes of amalgamation, we see that quicksilver is a powerful solvent of metals; all of which may be mixed together by making each separately into an amalgam. Chemists have proposed various methods of making amalgams, some of which may perhaps be cheaper and better adapted to particular purposes in the arts, to which they are chiefly devoted. All amalgams are white, from whatever metal prepared.

2. *Amalgam of* Silver.—Precipitate pure silver from nitrous acid, and proceed as is directed hereafter with regard to copper.

3. *Amalgam of* Lead.—Melt pure lead in an iron ladle, then put to it an equal quantity of pure quicksilver previously made hot. Stir them with an iron rod, in order to mix them, and let the mixture cool. The substance thus formed is a hard silver-coloured mass; but, by rubbing, it becomes softer. Put this mass into a glass mortar; rub it, and add what quantity of quicksilver you please, and it will unite to it most intimately.

4. *Amalgam of* Tin.—In forming this amalgam it is only necessary to proceed as with lead.

5. *Amalgam of* Copper.—Saturate nitrous acid with pure copper; then dilute the solution with twelve times its quantity of distilled water. Into the liquor, while it is hot, put plates of polished iron, and the copper will be precipitated as the iron dissolves. Proceed thus till no more copper will fall down; then pour off the liquor, and wash the precipitated powder with hot water until it is insipid. Dry the powder perfectly, and put it into a glass mortar, and, by rubbing, incorporate an equal quantity of quicksilver with it.

AMALGAMA'TION, *(amalgamatio)*; a term used to denote the softening of metals by tempering; but its customary sense is confined to the dissolving of metals with quicksilver. See Amalgam.

AMAME'LIS, (from αμα, and μηλεα, *an apple)*; the *amamelis* of Hippocrates is generally allowed to be the same with the *epimelis* of Dioscorides, which is the bastard medlar. There is another medlar in Italy, called the *epimelis*.

AMANI'TÆ, (from α, priv. and μανια, *madness)*; so named, because eatable, and not poisonous, like some others. Their tribe is, therefore, called *amanita*, *fungi*, and *tubera*; fungous productions, called *mushrooms*, *truffles*, and *morilles*; and, by the French, *champignons*. Tournefort enumerates eighty-three species.

The true mushrooms, called by the French *champignons*, are known by their external whiteness, and by being of a pale red within, when young; and of a deeper red when older: they are, at their first appearance, of a round figure, and not much larger than a small nut: after they have a little unfolded their membranes, they appear red, full, and close: on the top is a disagreeable softness, equal and white: the matter within is very white, with short and thick stalks. They grow in meadows and commons that have a good soil; and should be gathered for eating as soon after springing up as possible, for they contain an oily and a saline part: and, if they stay long before they are gathered, they will become more active and hurtful; hence those which grow on hot-beds, having more oil, are the best.

The disagreeable effects which some persons experience after eating them, may fairly be accounted for on the principle of idiosyncracy, or of weakness in the digestive organs, rather than on the absurd notion of their abounding with noxious animalculæ, as some have contended. As mussels, and a variety of other substances, produce similar effects upon peculiar constitutions, it rather is to be attributed to that cause than any other.

When the stomach is offended after eating them, some of the following symptoms are produced: a qualmishness first affects the patient, which in-

creases to a considerable degree of sickness, swelling of the stomach or of the belly, restlessness, giddiness, a palpitation of the heart, heartburn, colic, hiccough, diarrhœa, accompanied with a tenesmus, flushing heat in the skin, with more or less of redness there, and swelling in the face, and sometimes a sensation all over the body, which resembles what is felt from a general swelling; the patient stares in an unusual manner; all objects appear different from what they did before; a difficulty of breathing comes on, and the mind is strangely confused. A delirium even, trembling, watching, fainting, cold sweats, apoplexy, and convulsions, have been consequences following the eating of this sort of fungus.

For the relief of a person under these circumstances, give, as speedily as possible, a vomit of from gr. x. to ℈i. of vitriolated zinc, dissolved in a little warm water; and, if the sickness is still urgent, repeat the same quantity two or three times, till the stomach has been well emptied. After this, give now and then some vinegar, a large spoonful in a glass of water, sweetened to the palate. As the poison of this vegetable is not of the acrid kind, fat broths and oily medicines are useless. After evacuations upwards, it is necessary to procure a passage downwards: if the patient cannot swallow purgatives, let cathartic glysters be given, though the first are preferable. If any paralytic symptoms appear, apply sinapisms or blisters; and perhaps electricity may be happily used in such instances.

The *morille* is a kind of spring mushroom, as large as a nut, oblong, shrivelled, tender, porous, and cavernous, like the honeycomb, of a yellowish white colour, or inclining to red, and sometimes blackish: they are not so frequently hurtful as the common mushrooms. They are met with on moist grassy soils, in woods, and on the roots of trees. Dr. Cullen has observed, that these fungi have originally been considered of a vegetable nature; but later experiments prove them to participate more of animal; because, on analysing them, they afford the same product as animal substances; for, distilled without addition, they afford no acid, but a large proportion of volatile alkali; and exposed, so as to undergo fermentation, become immediately putrid; hence are they considered more nutritious than any other of the vegetable class.

AMA'RA, (*marar*, to *grow bitter*, Heb.) bitters. This term is to be considered as very general, and running through a great part of the *Materia Medica*. The *amara*, however, are seldom simple, but combined with other qualities, as stypticity, acrimony, aroma, &c. Dr. Cullen, in speaking of bitter, means pure and simple bitter, like that occurring in gentian, bile, &c. In his list, he has not exactly confined himself to this; but considered as bitter those medicines in which that quality is chiefly prevalent. With regard to all bitter plants, a certain degree of stimulus is also to be perceived in them, depending on an essential oil, in greater or smaller quantity, giving distinction to the bitter. But this essential oil, as some have imagined, is not that part in which the bitterness resides; for, on drawing that off, the bitterness remains in its full force, only more pure. It must be confessed, however, that, in some particulars, the bitterness does seem to reside in the essential oil. More or less of stypticity is commonly joined with bitterness, and cannot be separated from it, though discoverable by striking black with a solution of green vitriol. It is commonly said, that bitters give more fixed alkali than other plants; and, from a variety of trials, Dr. Cullen believes the fact to be true. What is to be inferred from this, he says, is very uncertain. The chemists imagine the alkali is contained in the animal fluid, in the same state; but in this they are mistaken; for, though bitters check fermentation, it is very far from being in the same manner as an alkali, which acts by destroying an acid.

The *common virtues* of bitters are these:—all are more or less stimulating and strengthening; hence they are supposed to promote appetite, and assist digestion. In the *stomach*, they check fermentations of all kinds; on the one hand preventing a noxious acid, and on the other resisting putrefaction. It is very probable, that their assisting digestion depends as much on this resisting putrefaction, as on their stimulant quality; for many substances which contain more stimulus, are without that effect. Many bitters excite vomiting, but without any emetic power, as has been supposed. Universally they are nauseous; and, when taken in warm water, impede, rather than promote vomiting. The proof is this; that, if a slight impregnation be equally nauseous, it will be as effectual as a strong one; and that, given in powder, so as to pass the fauces without being tasted, they have no such property.

In the *intestines*, their stimulant virtue is better founded. Their taste resembles the bile of animals, and, seemingly in the same manner as that does, they seem to promote the peristaltic motion. In trying chamomile for the cure of intermittents, Dr. Cullen gave it in the dose of ℥j. without any proper purgative quality; though he owns, that in such a quantity, it commonly moved the belly. In the intestines they have an anthelmintic quality. All animals seem to shew an aversion to the class of bitters, and there are instances of insects avoiding their odour, which possibly may be the case with worms; and undoubtedly, if these creatures swallow them, they may be destroyed, as bitters are possessed of a poisonous quality. But we now know, that anthelmintic bitters are of very little efficacy; and physicians suppose they,

rather act by strengthening the tone of the intestines, and shaking off the mucus, in which the eggs of the insects are contained. This, however, cannot be proved satisfactorily.

In the *mass of blood*, bitters sometimes pass off by urine; in some cases giving colour and smell to it, or at least changing its condition. Bitters have been recommended in the jaundice. Their virtues, as may perhaps be said of all medicines recommended in this disease, are much to be suspected. Dr. Cullen owns, however, that after the use of bitters, when the urine flowed yellow, its consistence and condition was changed. As promoting urine, they have been used in dropsies. By themselves, their effects here are not very remarkable, but are promoted by union with alkaline salts. These two medicines seem mutually to increase each other's powers. Bitters are said to be diaphoretic and sudorific; and actually, in large doses, and under proper regimen, they will excite sweat as soon as any medicine known. Whether this virtue is to be imputed to their action on the skin, or on the stomach, is dubious. From the suddenness of their effect, the latter is the more probable case. In consequence of their diaphoretic virtue, they are recommended as alexipharmics in fevers, in which cases they may be given with more safety than some other stimulants employed, or perhaps than the *serpentaria*. In consequence of their alexipharmic virtue, they have been supposed deobstruents in the whole of the system, and used in rheumatic affections. They have been supposed too, as stimulants, to promote the hæmorrhoidal flux, and that of the menses. Aloes have been alleged as an instance of bitters promoting those fluxes, but in that the bitter is joined with a considerable purgative quality. In hæmorrhoidal cases, in great quantity, they may be of some service; in the ordinary quantity we employ them for the menses, they are of none. As strengthening the system, they have been used in the cure of intermittents. They certainly will cure; but, Dr. Cullen says, after repeated trials, he found them not nearly so powerful as the bark.

They have also been employed in continued fevers; but the particular cases in which they are proper, are difficult to determine. They have been supposed to remove obstructions in the abdominal viscera, and have been called hepatics and splenetics. Their specific property cannot easily be conceived: they may be used in obstructions of the liver and spleen, as in those of the other abdominal viscera, and therefore may be employed in cachectic cases. In scrophulous cases, if the Peruvian bark be found of advantage, we may infer the analogy to other bitters. Bitters have been supposed to cure the *gout*, and in one shape they really do so.

Not long ago, in England, the duke of Portland's powder came into great reputation. It is composed of the *aristolochia* and four other bitters; for Dr. Cullen considers the *aristolochia* as a bitter; though, from its fœtid odour, it be transferred to another class. This powder, in the duke of Portland himself, and in many others who used it, prevented the painful return of the gout in inflammation of the extremities, and thus seemed to cure the disease; but almost always with a considerable change in the system, and pernicious consequences. The doctor goes the length of asserting, that ninety out of an hundred who took this remedy, in a year or two after were carried off by apoplexy, &c. or some other mortal disease. In Scotland, only twelve or fourteen persons have taken this powder, and all have done it with the consequences mentioned. The course of the medicine must be continued for two years to produce the cure proposed. Many have not had patience to go through this course, and therefore with them the medicine has neither had the effect of curing the gout, nor of bringing on any other disease. All this Dr. Cullen mentions from his own knowledge. The history of this medicine is given in a paper of Dr. Clephane, in the London Essays, where he shews us it has been mentioned by every practical physician since the time of Galen. Some alterations, at different times, have been made in the prescription; but such as allow it always to be considered as a bitter medicine. At the same time that authors recommend it, they have always subjoined a caution as to its use. Upon its reputation in England, trial was made of it; and Gaubius gives testimony of its having the effects we have described. See Portland Powder.

Such is the state of the facts with regard to this use of bitters. How they act in other cases, we shall not take upon us absolutely to determine. This account may throw some light upon any method which may be taken to explain it. Stimulants destroy the tone of the stomach. Boerhaave, in a work which, as spurious, should not be quoted, were we not certain of the fact alleged, in his *Prælectiones de Materia Medica*, tells us, that *aristolochia* destroys the tone, smooths the inner side of the stomach, and takes off its villous coat. From all this we see how sparing ought to be the use of bitters in stomach complaints. But, as the gout seems to be sent to the extremities by increasing the tone of the stomach, we in some measure conceive how bitters act in preventing its appearance in the extremities. Whether it is from the arthritic effort that the disease is thrown upon the brain, Dr. Cullen does not determine.

Having mentioned the arthritic, we shall here speak of the *antinephritic* virtues imputed to bitters, where they are supposed to act as diuretics. As this effect of being diuretic is not considerable, and as they are not supposed to change the figure,

&c. of the stones in the kidneys, from analogy we may infer, that their action is much in the same way with some medicines mentioned for the stone. There is a similarity between arthritic and nephritic cases. It is commonly supposed that the nephritic fit is owing to the size, weight, roughness, &c. of the stone in the kidneys. When a person is seized with the gout, he is relieved from the symptoms arising from such supposed causes; but how an inflammation can take off the size, &c. of a stone in the kidneys, it is impossible to imagine. We must then suppose, that the affection of the kidneys is the cause of concretion of the stone, and not the latter of the former; in the same manner as gout causes concretions of chalk, so the gout, from taking off this affection of the kidneys, relieves the symptoms consequent upon it. This will be understood from what we have said on the *uva ursi*. See Uva Ursi.

Dr. Cullen mentions two remarkable instances, where the stone in the kidneys remained, and yet the patient was relieved from nephritic complaints by the attack of a gouty paroxysm. A gentleman, from nephritic complaints was seized with excessive strangury, fœtid purulent urine, and ulcers in the whole track of the urinary passages, hectic paroxysms, &c. insomuch that it was thought his case was desperate, when being unexpectedly seized with the gout, he was relieved from these complaints; his urine became less fœtid, freer, &c. and, for a fortnight, during which the gout lasted, enjoyed an interval of ease from his nephritic pains. Nothing more clearly than this shews the connexion between the *arthritis* and *nephritis*. Another person, troubled with the gout, was seized with *nephritis*, upon whose increase the gout was proportionably diminished. Upon dissection, no stone was found in the kidneys. This case seems peculiarly to have been adapted to the *uva ursi*. Notwithstanding this dangerous antiarthritic power of bitters; yet certainly, in nephritic cases, they may have still merit enough to be worth inquiring into. Upon the whole, we see the intimate connection between the two diseases, which possibly also may extend to their remedies; and certainly it would be equally ridiculous to reject their power upon the kidney, as to admit of their action on the stone.

Bitters are alleged to have somewhat of a narcotic quality, especially applicable to those vegetables which abound in essential oil. So far as this property is to be discovered in wormwood, it depends on the peculiarity of its essential oil, and not on its bitterness. Opium is a bitter, but it would be foolish to say its narcotic qualities depend upon this. It is necessary to mention this, as some persons deduce the bad consequences of bitters from it.

Bitters are said to weaken the system in general, and particularly the genital powers. Of the truth of this, Dr. Cullen does not venture an opinion. It is scarcely to be known, he says, but from a very disagreeable experiment, an experiment on one's self. He is more certain, however, of another bad effect imputed to them, viz. hurting the eyes. Thus, down from the times of the ancients, it has been observed, that wormwood (and the same property may reside in all the bitter vegetables) affects, like sage, the eyes, with an uneasy dryness, weakness, contraction, and inflammation, attended with head-ach. These effects seem to depend on the narcotic quality, as the few which are chargeable with them abound with an essential oil.

Bitters have been erroneously supposed to neutralise acids, and on that account their use has been thought important in cases where acidities have prevailed in the stomach. They may, however, be considered as indicated on a double account, viz. to correct this tendency by their bracing and corroborating effects, though incapable, by any chemical change, to remove the cause of it. When given with such intentions, they are often infused in brandy, or in some of the strongest wines; in which state some grow too fond of them, and commence the fatal practice of dram-drinking.

In disorders where the bile is defective, they are administered with considerable advantage, as they check the general tendency to sourness in the first passages, which is so constantly an attendant on a defective supply of bile; and also to remove flatulencies. The amara lose their bitterness on the addition of alkaline salts; and yield their virtues both to watery and sprituous menstrua by way of infusion, tincture, or decoction, though very little of their taste is obtained by distillation, either with water or spirit. Absinthium, artemisia, tansey, carduus, chamomile, gentian, &c. are amongst the list of bitters, which have been termed *amara calida*, as being also possessed of some aromatic qualities.

AMARA FRIGIDA, cold bitters, so called because they contain no aroma, and in opposition to amara calida, spoken of above.

These vegetables have, on a wrong foundation, been supposed to possess a cooling virtue; and the mistake has probably arisen from the method of our using them at table, young and blanched, in which state they contain only a mild vegetable juice.

According to Dr. Cullen, the four first belong to the subdivision syngenesia; the semiflosculosæ. This order are all lactescent and acrid, and commonly containing an oily matter, which, when dried, is inflammable. They are all supposed of a poisonous nature; the above are the only exceptions, with some of the campanaceous tribe of plants, containing a milky juice, and not being

poisonous. Even here their quality is suspected, and some of them, as the lactuca, is reported to have a strong narcotic virtue; and therefore, although these four were set down as specimens of the whole, the analogy must be transferred, with very great caution, to the rest of the tribe. Even the esculent lettuce, by Galen, is maintained to be of a poisonous nature. This was probably owing to the heat of the climate; but it shews the tendency of such plants. Besides the milky juice, these plants contain an essential salt, in which the cooling quality is supposed to reside; but it cannot be extracted in such quantity as to shew that effect. As to their medicinal qualities, they have the common virtues of bitters. *Materia Medica* writers constantly talk of their aperient qualities, and imagine them almost specific in visceral obstructions. In confirmation of this they prove purgative, and in that manner may be useful to the hypochondriacs. Boerhaave has a particular affection for the *amara frigida*, and supposes they have a power of dissolving the *atrabilis* he thinks present, and of washing off impurities from the blood. Dr. Cullen employed the juice of the *dens leonis* in the quantity of ℥iv. but neither observed its laxative nor diuretic power. Boerhaave talks of their saponaceous quality very much, but without any precision; for whenever we lose sight of a combination of alkali and oil, and talk of a soap composed of any saline or inflammable substance, we can convey nothing distinct to the reader, nor accurate as to what virtue we mean the substance exerts. Such soapy qualities are denied, and with regard to the *amara frigida*, their use in medicine is not yet ascertained. See MATERIA MEDICA.

AMARA DULCIS. See DULCAMARA.

AMARANTH, ESCULENT. The leaves of this plant, which is the *amaranthus olearaceus* Linn. and several other species, are eaten in India the same as cabbage is eaten with us.

AMARA'NTHUS OLERACEUS. See AMARANTH, ESCULENT.

AMATO'RIA, *vel Amatoria Febris*, the fever of lovers; also the *chlorosis*. Vogel defines it to be a fever of a few hours continuance, beginning with a great degree of coldness, and arising from eager expectation.

AMATORII MUSCULI, the *muscles* of the eyes, which move them when we are said to be ogling. When the abductor and humilis act together, they give the eyes this oblique motion. These muscles are also called obliquus inferior, and superior, oculi.

AMAURO'SIS; (αμαυρωσις; from αμαυροω, to *darken*); the *gutta serena*, or *amblyopia*. There occurs in this disease, a total loss of sight without any visible injury to the eye, the pupil mostly dilated and immovable. It is a genus of disease in the class *locales*, and order *dysæsthesiæ* of Cullen. It arises generally from compression of the optic nerves, *amaurosis compressionis*; from debility, *amaurosis atonica*; from spasm, *amaurosis spasmodica*; or from poisons, *amaurosis venenata*. See GUTTA SERENA.

AMBAI'BA, (an Indian word). A tall tree growing in Brasil, with but few branches at the top, is called by this name. The trunk is hollow its whole length, except that its cavity is divided by a transverse membrane at every two or three inches distance, in the middle of which is a small hole. The root is very hard, even so as, by a gentle friction, to afford fire enough to burn cotton, and such like matter. The buds afford a juice that is cooling, if mixed with gruel, and also a nutritious substance, which the Indians call tapioca.

A'MBE, or A'MBI, (from αμβη, a *lip*, *edge*, or *border*); an instrument of ancient invention, but still used in dislocations of the humerus. See DISLOCATION and HUMERUS. Hippocrates has taken notice of it in his treatise De Articul. sect. vi. and it is called Hippocrates' AMBE. Galen explains the word *ambe*, αφρυωδης επαναστασις, *an eminence like a border*; and says, that the whole machine takes that name, because its extremity runs out with an edge, like the lip or brim of a pot, towards the interior cavity, which, as well as the edge or border of any thing on the top or extremity, are signified by the word *ambe*. When the head of the humerus happens to rest in the axilla, this instrument is sometimes of service; but in no other case. Even here it is rarely used; for when gentle methods fail, violence seldom succeeds.

AMBER, (*succinum*); a bituminous substance of a yellow or brown colour, either transparent or opake, which takes a beautiful polish, and, after rubbing, becomes so electric as to attract straws and small bodies to which it is offered; hence it was called *electrum* by the ancients, and hence too the word electricity. If it be powdered it emits an agreeable smell. It is dug out of the earth at various depths, and often contains insects in high preservation, a circumstance which proves that it has been liquid. Amber is also found floating on the shores of the Baltic, and is met with in Italy, Sicily, Poland, Sweden, &c. From its colour or opacity it has been variously distinguished; thus white, orange, golden, cloudy amber, &c. An oil is obtained from it, which, as well as its other preparations, is used in medicine against spasmodic and nervous affections. See SUCCINUM.

AMBERGRISE. See AMBRAGRISEA.

AMBLO'SIS, (αμβλωσις; from αμβλοω, to cause abortion), a miscarriage, or premature birth.

AMBLO'TICA, (αμβλοτικα; from αμβλοω, to *cause abortion*); medicines which were supposed to occasion abortion in women.

AMBLYO'PIA, (from αμβλυς, *dull*, and ωψ, an *eye*); a debility or dulness of sight: an incipient amaurosis. The *amblyopia* is said by some writer

to be fourfold; viz. 1st, *Myopia*, or *short-sightedness;* 2dly, *Presbytæ*, or *seeing only at a great distance;* 3dly, *Nyctalopia*, or *seeing only in the night*, which Celsus names *Imbecillitas Oculorum;* 4thly, *Amaurosis*, *dimness of sight*. Dr. Cullen places this word in his Nosology as synonymous with the word dysopia, which is his generic term for those disorders in and of the eye, called myopia, &c. The *amblyopia* of some writers is the amaurosis of Dr. Cullen; for the different species of which see DYSOPIA. See also Sauvages's Nosology of the Eyes, p. 151, &c.

A'MBRAGRI'SEA, (from *gris*, *grey*); called *cinereum*, from its being of the colour of *ashes*. Of this substance, much is met with in the Indian Ocean; pieces of a considerable weight having been found in the northern seas. Sometimes it is seen floating on the surface of the sea, at others adhering to rocks, and not unfrequently found in the stomachs of fishes, and now and then it is thrown on the shore; but it is found most plentifully about the island of Madagascar and the Molucca Islands; and yet most of the ambergrise which is brought to England comes from the Bahama Islands, from Providence, &c. where it is found on the coast. According to an account in the Philosophical Transactions, this drug is only the produce of the male spermaceti whale; it is there said to consist of balls, from three to twelve inches diameter, lying loose in a large oval bag three or four feet deep or wide, nearly in the form of an ox's bladder, with a pipe running into and though the penis, four or five feet below the navel, and three or four feet above the anus. This bag is almost full of a deep orange-coloured liquor, not quite so thick as oil, of the same scent as the ambergrise which swims in it. These balls of ambergrise seem to be in laminæ, like onions; and in the fluid, pieces of the laminæ are found. There are two, three, or four balls in a bag. Where one whale has these balls, three or four have only the liquor in the bag. Some fishermen observe that these balls are only in the old and well-grown whales. The rarity of catching a female whale renders it difficult to say that they do not produce any ambergrise. It may be observed, that, as there is only one bag, it is probably the urinary bladder; and the balls, preternatural concretions formed there, as the bezoars are in their respective situations. Neumann thinks it is a bitumen; and of this opinion there are many others; but a paper presented to the Royal Society, by Dr. Swediaur, asserts its animal production, and declares it to be the indurated fæces of the spermaceti whale. It is remarkable that Messue, an old writer, has asserted that it is the *spawn of the whale.*

Pure ambergrise is so light, that it swims in rectified spirit of wine; it grows soft in a very gentle heat; it is opake, rugged, of a greyish ash-colour, mingled with yellow and blackish veins, and speckled with greenish spots; it breaks like wax; it has no particular taste, though softish, oily, and somewhat aromatic; it affords but little to the smell, except it is heated, and then it is very fragrant; set on fire, its odour is like that of burning amber; with a small degree of heat it melts into an oil, and in a great heat it is volatile. The genuine kind is speckled with green; the more it is variegated, the worse; *the best is of an ash-colour*, the inferior sorts approaching to a deep black.

It is soluble in boiling spirit of wine; from which, if the saturated solution be set in a very cold place, a part of the ambergrise concretes into a whitish unctious substance. Distilled, it yields a water, a brown acidulous spirit, a deep-coloured oil, a thicker balsam, and sometimes a little concrete salt. The spirit, oil, balsam, and salt, are similar to those obtained from amber, except that the oil is more agreeable to the smell.

Rectified spirit of wine takes up nearly one twelfth of its weight of ambergrise. According to Neumann, if the spirit is impregnated with a little essential oil, the ambergrise will dissolve more readily in it. A deeper-coloured tincture is made with alkohol, but not a stronger. Weak acids and alkalis have no effect upon it; water and expressed oils have as little.

It is one of the most agreeable perfumes, it heightens the natural odour of other bodies; but the great secret to this end is, to add it so sparingly, that while it improves the smell of that to which it is added, its own may not be discovered. Given internally, from two grains to a scruple, we are told by writers on the Materia Medica, it is a high cordial and powerful antispasmodic; though the common dose is from two to four grains. Dr. Cullen avows his entire ignorance of the qualities of ambergrise.

A tincture was formerly directed, consisting of ʒij. of ambergrise to ℥vj. of rectified spirit of wine. Of this a few drops would strongly flavour a large quantity of inodorous matter. It is necessary, in preparing it, to make the spirit simmer with the ambergrise till it is dissolved. If the tincture be of considerable strength, when dropped into water, a very milky appearance immediately follows.

AMENORRHŒA, (from α, priv. μηνιαιος, monthly, ρεω, *fluo*); a partial or total obstruction of the menses in women from other causes than pregnancy. In his Nosology, Dr. Cullen places this genus in the class *Locales*, and order *Epischeses*. His species are, 1. *Emansio mensium;* that is, when the menses do not appear so early as is usually expected. 2. *Suppressio mensium*, when, after the menses appearing and continuing as usual for some time, they cease without pregnancy occurring.

3. *Amenorrhœa difficilis, vel Menorrhagia difficilis,* when this flux is too small in quantity, and attended with great pain and uneasiness. This, with some other symptoms, as dyspepsia, yellowish or greenish colour of the skin, unusual appetites, &c. constitutes the chlorosis, and which seldom or never appears without a suppression of the menses. In Dr. Home's Clinical Experiments we find the virtues of several emmenagogues set forth in the following manner:—Chalybeates seldom or never succeeded: they were always found more useful in diminishing the evacuation when too violent, than in restoring it when deficient. The tincture of black hellebore proved successful only in one of nine or ten cases, though given to the length of four tea-spoonfuls a day, which is double the quantity recommended by Dr. Mead. Compression of the crural artery, recommended by Dr. Hamilton, in the Physical and Literary Essays, vol. ii. proved successful only in one of six cases. From the effects produced by this compression, it has the strongest appearance of loading the uterus with blood; from the sensations of the patient it produces the same effects as the approach of the menses, and has every appearance in its favour; yet does not succeed. Dr. Home supposes that the uterus is more frequently in too plethoric and inflammatory a state; in which case, this remedy will do more hurt than in a state of inanition; however, he owns, that in the case in which it did succeed, the patient was plethoric and inflammatory. Venæsection is recommended as an excellent remedy; the doctor gives three instances of its success, and says he could give many more. It acts by removing the plethoric state of the uterus, relaxing the fibres, and giving the vessels full play; so that their action overcomes all resistance, and the evacuation takes place. It is of no great moment from whence the blood is taken: the saphænic vein will perhaps empty the uterus most; but it is difficult to get the proper quantity from it, and the quantity of the discharge cannot be so well measured. The powder of *savine* is a most powerful remedy; and proved successful in three cases out of four in which it was tried. It was given to the quantity of half a drachm twice a day. It is a strong topical stimulus, and seems improper in plethoric habits. *Madder-root,* according to Dr. Home, is a very powerful medicine in this disease; and proved successful in fourteen out of nineteen cases in which it was tried, being sometimes exhibited in the quantity of two scruples, or a drachm, four times a day. It has scarce any sensible effects; never quickens the pulse, or excites inflammatory symptoms: on the contrary, the heat, thirst, and other complaints abate; and sometimes these symptoms are removed, though the disease be not cured; but when it succeeds, the menses appear from the third to the twelfth day.

For other methods of curing the *amenorrhœa,* see CHLOROSIS.

AMENTA'CEÆ, (from *amentum, a bond,* or *thong);* the name of the sixteenth order of Linnæus's fragments of a natural method in the *Philosophia Botanica,* and of the fiftieth at the end of his *Genera Plantarum;* also, of a class in Tournefort's, Boerhaave's, and Royen's Systems of Botany. The *amentaceous flowers* are such as have an aggregate of summits, hanging down in form of a rope or of a cat's tail, as the male flowers of the mulberry, swallow wort, hazel, birch, &c. These are also called Catkins.

AME'NTIA, (from *α* privat. and *mens,* the mind); *madness,* or *insanity;* also named *fatuitas, idiotism,* &c. Dr. Cullen defines it to be a weakness of the mind in judging, from either not perceiving or not remembering the relations of things. He ranks this genus of diseases in the class neurosis, and the order vesaniæ. His species are,

1. *Amentia congenita,* natural stupidity, i. e. from the birth.

2. *Amentia senilis,* dotage, or childishness, from the infirmities of age.

3. *Amentia acquisita,* when, from accidental injuries, a person becomes stupid or foolish.

The last of these seem only to come within the reach of the medical art, to afford any relief; and this species arises from the powers of the constitution being greatly debilitated by preceding illness, such as nervous and putrid fevers, long continued intermittents, and other complaints where the nervous system has been long and severely affected. Chearful company, gentle exercise in a clear air, a generous mode of living, properly regulated, and cordial medicines, if necessary, bid the fairest for performing a cure; for the whole idea belonging to the cure of this complaint is, by proper means, to invigorate the system, already reduced to too great a state of debility, whence the thinking faculties participate in that weakness. It must be admitted, however, that there is too much uncertainty in the best medical treatment of amentia that can be devised. For other species of insanity, see MANIA, &c.

AMIA'NTHUS, (from *α.* priv. and *μιαινω, to pollute);* so named from its white or silvery gloss, which conveys the idea of purity; also called *asbestos, linum fossile, &c. earth flax,* a mineral substance, found in lumps of different sizes, of a greyish colour, with a glistening surface, and composed of small filaments. It is met with in many of the islands of the Mediterranean sea. Italy produces abundance, and it is worked there either into linen or paper, both which resist the fire. It is dug up also in the island of Anglesey, and in Oxfordshire. The cloth made with it is not cleaned by washing, but by burning; and the paper written on becomes clean again by the same pro-

cess. When to be worked into thread, &c. it is first steeped in water to dissolve its earthy parts. This makes its threads separate; then the flaxy part is dried in a sieve, and afterwards carded like wool, and, with the fingers wetted with oil, it is twisted as it is drawn round upon a reel, which is first wound over with fine thread; but mixing the asbestos with flax, on a distaff, and spinning them together, works the latter into a thread, which is afterwards separated by the fire, and thus the asbestos thread is left in a proper state, and in this way, carding is not needful. This cloth, when made, is at best a mere curiosity; though it is said, it was employed by the ancients to enclose the bodies of the dead, previously to their being burnt, in order that the ashes of the deceased person might be preserved from loss or intermixture.

A'MMI, (αμμι, from αμμος, *sand;* from its likeness to *little gravel stones*), the herb called *royal cummin* and *bishop's-weed*, of which there are two sorts, *viz.* the *ammi verum* and the *ammi vulgare.*

AMMI MAJUS, the systematic name for the *ammi vulgare.* See Ammi Vulgare.

AMMI VERUM. The seeds of this plant, *sison ammi; foliis tripinnatis, radicalibus linearibus, caulinis setaceis, stipularibus longioribus* Linn. have a grateful smell, somewhat like that of origanum, and were formerly administered as a carminative, but are now out of vogue.

AMMI VULGARE; the *ammi majus; foliis inferioribus pinnatis, lanceolatis, serratis; superioribus multifidis, linearibus* Linn. The seeds of this are less powerful than those of the *sison ammi*, but were exhibited with the same views formerly.

AMMITOS, or Ammites, (from αμμος, *sand);* a sandy stone. Some are small as poppy-seed; others as large as a hazel nut. When as large as a pea they are called *bezoar mineral.* They are found near Berne in Switzerland.

AMMO'NIA MURIATA. The article to which this name is given in the pharmacopœias, being a muriate of ammonia is called in the new chemical nomenclature, *muriated ammonia.* It is found in great abundance in nature, but is also prepared from a variety of substances. It is brought to us generally in round cakes, convex on one side, and concave on the other, from the shape of the vessels into which they are sublimed. When these cakes are broken, the salt appears of a needled texture, or composed of striæ, running transversely and parallel to one another: the internal part is generally pure, and of an almost transparent whiteness; the outside, for the most part, is foul, and of a yellowish green or black hue.

In England, this salt is obtained from burnt cow's dung; urinous salt, joined with an acid, produces ammoniacal salt; it is obtainable from every species of feces by sublimation or solution. At Newcastle it is made from the bittern, which remains after making common salt, and old urine; from one hundred pounds weight of the bitter cathartic salt, and three hogsheads of urine, fifty-six pounds weight of muriate of ammonia are obtained.

The combination of ammoniae with muriatic acid, is one of the most interesting, and the most generally used. It has commonly been known by the name of sal ammoniac. This salt may be directly formed by decomposing the muriate of lime by means of ammoniac, as has been practised by Mr. Baumé. This salt is prepared in large quantities in this country. The volatile alkali is obtained from soot, bones, and other substances known to contain it; and to this the vitriolic acid is added; and this vitriolic ammoniac is decomposed by common salt by means of a double affinity. The liquor obtained in consequence of this decomposition contains sulphate of soda and sal ammoniae. The former is crystallized, and the latter sublimated so as to form cakes, which are then exposed to sale. By an ingenious process, Lord Dundonald also extracts ammoniac from pit-coal. But formerly almost all the sal ammoniac which was employed in commerce was brought from Egypt, where it was extraeted by distillation from soot, by the combustion of the excrements of such animals as feed on saline plants. This soot is put into large round bottles a foot and an half in diameter, and terminating in a neck two inches long. These bottles are filled up till within four inches of the neck. Each bottle holds about forty pounds of soot, and affords nearly six pounds of salt. These vessels are put into a furnace in the form of an oven, so that only the neck appears above. A fire of camel's dung is kindled beneath it, and continued for thee days and three nights. On the second and the third day the salt is sublimed. The bottles are then broken, and the salt taken out in cakes. These cakes, which are sent us just as they have been taken out of the bottles in Egypt, are convex, and unequal on the one side: on the middle of that side they exhibit each a tubercle corresponding to the neck of the bottle in which it was prepared. The lower side is concave; and both are sooty.

It may also be observed, that sal ammoniac is continually sublimed through the apertures of volcanic mountains. It has been found by Mr. Ferber among volcanic products; and by Mr. Swab, and other chemists, in the grottos of Puzzolo. It is also produced in the human body, and exhales by perspiration in malignant fevers. Mr. Model has proved this fact in his own person: for at the time of a violent sweat which terminated a malignant fever, he washed his hands in a solu-

tion of potass, and observed that a prodigious quantity of alkaline gas was disengaged from the solution.

The muriated ammonia or sal ammoniae crystallizes by evaporation in quadrangular prisms, terminated by short quadrangular pyramids. It is often obtained in rhombic crystals by sublimation; and the concave face of the loaves of sal ammoniae in commerce is sometimes covered with these crystals. This falt has a penetrating, acrid, urinous taste. It possesses a degree of ductility which renders it flexible, and causes it to yield to a blow of the hammer. It does not change in the air; which circumstance renders it probable that our sal ammoniac is different from that mentioned by Pliny and Agricola, as that attracted humidity. Three parts and a half of water dissolve one part of sal ammoniac, at sixty degrees of Fahrenheit's thermometer; and a considerable degree of cold is produced by the solution. One hundred parts of sal ammoniac contain fifty-two parts of acid, forty of ammoniac, and eight of water. This salt is not at all decomposed by clay; nor by magnesia, except with great difficulty, and only in part; but it is completely decomposed by lime and fixed alkalis. The sulphuric and nitric acids also disengage the acid of ammoniae. This salt is employed in dying, to bring out certain colours. It is mixed with aqua fortis in order to increase the solvent power which it possesses. It is also used in soldering, in which operation it possesses the double advantage of clearing the metallic surface, and preventing the oxidation of it.

Pure muriate of ammonia has an acrid, pungent, urinous, taste. It is soluble in about three times its weight of water at 60°, and in an equal weight at 212°. During its solution, it has been found to produce thirty-two degrees of cold. It is also soluble in about 4.5 parts of alcohol. It is permanent in the ordinary state of the atmosphere. By a gentle heat, it may be deprived of its water of crystallization, and reduced to the form of a white powder. At a higher temperature it sublimes unchanged. Its crystals are either six-sided pyramids, aggregated in a plumose form, or still more commonly four-sided pyramids. It consists of 42.75 muriatic acid, 25.00 ammonia, and 32.25 water. It is decomposed by the sulphuric and nitric acids, by baryta, potass, soda, strontia, and lime; by several secondary salts, containing these acids or bases; and by those metalline salts whose bases form with muriatic acid a compound that is insoluble. As a medicine, the muriate of ammonia is now seldom used. Internally, it was formerly supposed to be a powerful aperient and attenuant of viscid humours. By surgeons, however, it is externally applied, and is a valuable remedy. It may act in two different ways, *viz.*

1. By the degree of cold which is produced during its solution.
2. By its stimulating properties.

It is from the former of these causes that fomentations of muriated ammonia probably prove beneficial in mania, apoplexy from plethora, tension of the vessels of the head, and in violent headachs. When used with this intention, the solution should be applied as soon as it is made, as the cold is then most considerable.

On the latter principle may be explained its action as a discutient in indolent tumors of all kinds, contusions, gangrene, psora, ophthalmia, cynanche, and in stimulating clysters. In some cases, as in chilblains and other indolent inflammations, both modes of action may be serviceable. When first applied, the coldness of the solution will diminish the sense of heat and uneasiness of the part, and the subsequent stimulus will excite a more healthy action in the vessels of the affected part.

The officinal preparations are: *Aqua ammoniæ* Edin. Lond. Dubl. *Alkohol ammon.* (See Alkohol.) Edin. Lond. Dubl. *Carbonas ammoniæ*, Edin. Lond. Dubl. *Aqua carbon. ammon.* Edin. Lond. Dubl. *Liquor cupri ammoniati*, Lond. Dubl. *Murias ammoniæ et ferri*, Edin. Lond. *Calx hydr. alba*, Lond. *Spiritus ammon. fœtid.* Lond.

Murias Ammoniæ et Ferri. Edin.

Take of the red oxide of iron, washed and dried;
Muriate of ammonia, of each equal weights;
Mix them thoroughly and sublime.

Ferrum Ammoniacale. Lond.

Take of Iron filings, one pound;
Sal ammoniac, two pounds.
Mix them and sublime. What remains at the bottom of the vessel mix, by rubbing together with the sublimed matter, and sublime a second time.

Formerly these preparations had the name of Flores Martiales.

Although, at a low temperature, ammonia decomposes the muriate of iron; at a high temperature, iron and its oxides decompose muriate of ammonia. But as muriate of ammonia is itself a volatile salt, a great part of it escapes undecomposed; so that the product is a mixture of muriate of ammonia with red muriate of iron. According to the Edinburgh formula, the decomposition is effected by simple affinity. As soon as the oxide of iron acts on the muriate of ammonia, the ammonia which is separated passes over: then, as the heat increases, undecomposed muriate of ammonia is sublimed; which, as the process advances, is

mixed with an increasing proportion of muriate of iron. But in the process of the London college, the decomposition is more complex; and a considerable quantity of hydrogen gas is produced. In both a much larger quantity of iron is used than necessary. According to the German accounts, if the iron be equal to one sixteenth of the muriate of ammonia, it is sufficient. The new Prussian Dispensatory directs one ounce of iron to be dissolved in two ounces of muriatic acid, and one of nitrous acid; this solution of red muriate of iron is mixed with a watery solution of twelve ounces of muriate of ammonia, and the whole evaporated to dryness; and lastly the dry mass is also sublimed in a wide-necked retort, with a red heat.

Whatever be the process, the heat must be applied as quickly as possible; and the sublimed matter thoroughly mixed afterwards by trituration, and kept in well-stopt glass bottles. It should, if properly made, have a deep orange colour, and a smell resembling saffron, and should deliquesce in the air with very little exposure.

This is the preparation so extensively tried by the late Mr. Justamond, of the Westminster hospital, in the treatment of Cancer.

AMMONIA ACETATA; acetated ammonia, of which is prepared the *water of acetated ammonia*, formerly called *spirit of Mindererus*. It is the water of *acetite of ammonia* of the Edinburgh, and *liquor of acetated volatile alkali* of the Dublin Colleges.

Aqua Ammoniæ Acetatæ. Lond.

Take of prepared ammonia, any quantity.
Pour upon it as much distilled vinegar as may be sufficient to saturate the ammonia exactly.

We thus obtain acetated ammonia, dissolved in the water of the acetic acid; but as this will vary in quantity, the solution must also vary in strength, and the crystallization of the salt is attended with too much difficulty to be practised for pharmaceutical purposes. Its crystals are long, slender, and flatted, of a pearly white colour, and of a cool sweetish taste, are very deliquescent, melt at 170°, and sublime at 250°. It is decomposed by the acids, alkalies, and several of the earths, and metalline salts; and when in solution, its acid is decomposed spontaneously, and also by the application of heat.

In order to get a solution of greater strength and uniformity, Mr. Lowe saturates four ounces of carbonate of potass with distilled vinegar, and evaporates the solution to thirty-six ounces. He then mixes it with two ounces of muriate of ammonia, and distils the mixture in a glass retort. Acetate of ammonia comes over. The last edition of the Prussian Pharmacopœia prepares it by saturating three ounces of carbonate of ammonia with a strong acetic acid, (obtained by distillation from acetate of soda, dissolved in two parts of water, and decomposed by sulphuric acid), and diluting the solution with water, so that it shall weigh twenty-four ounces. One ounce, therefore, contains the alkali of a drachm of the prepared ammonia.

The acetate of ammonia given internally, and assisted by a warm regimen, proves an excellent and powerful sudorific; and as it operates without quickening the circulation or increasing the heat of the body, it is admissible even in febrile and inflammatory diseases, in which the use of stimulating sudorifics are attended with danger. Its action may likewise be determined to the kidneys, by walking about in a cool air. The common dose is half an ounce, either by itself, or along with other medicines adapted to the same intention; but an ounce is not, in general, too large a dose. An instance indeed occurred, at Edinburgh, of an apothecary's boy, who, from a singular liking to the taste, drank, whilst under preparation, an entire pint of it, without any mischievous effects.

This preparation would be greatly improved in its medical effects, and be much more palatable also, if prepared in the following way, recommended by Mr. Lynam, a practitioner in London.

Take a common stopper-bottle, for instance, the one which it is usually kept in, and fill it about two-thirds with acetum distillatum; then weigh the requisite proportion of ammonia, which break into lumps of a size sufficient to be admitted into the bottle, and put them in directly one after another; as, if the ammonia is broke too small, or put in too suddenly, it occasions too quick an extrication of the gas, and a quantity of it is lost. The stopper of the bottle must then be tied over with a piece of leather, and put in its usual place; interposing a substance between the top of the bottle and the superincumbent shelf, so as to fit tight, which considerably adds to the pressure, and tends to combine more intimately the carbonic acid gas. After having stood a few hours, the ammonia is dissolved, and the carbonic acid is absorbed by the liquor.

The aqua ammoniæ acetatæ, thus prepared, is very strongly impregnated with carbonic acid gas; and is greatly deprived of that mawkish disagreeable taste, which it has, when made in the usual way. Mr. Lynam, from experience, speaks of the superior good effects of this as a febrifuge remedy, with this peculiar advantage, that it tends to keep the bowels open, even when under the influence of opiates. It likewise sits easy upon most weak and irritable stomachs, when scarcely any other medicine would be retained.

According to *Bergman*, ammonia contains $\frac{45}{100}$ of carbonic acid, $\frac{43}{100}$ of pure ammonia, $\frac{12}{100}$ of wa-

ter, that is nearly half its weight of air; so that in a pint of the aq. ammon. acet. in which four drachms of ammonia are used, there are about 108 grains weight of air, which, according to its specific gravity, will be equivalent to $159\frac{1}{10}$ cubic inches of carbonic acid, the greater part of which unites with the liquor.

AMMONIA PRÆPARATA, *prepared ammonia; sal volatile salis ammoniaci;* or *sal alkali volatile;* in the pharmacopœias called *carbonas ammoniæ crystallisatus*, according to the new chemical nomenclature, it being a pure crystallized carbonate of ammonia. It possesses stimulating, nervine, antacid virtues, and is, in these points of view, in high estimation in dibility, typhus, ataxia, atonic spasms, paralysis, syncope, arthritis, rheumatism, &c. See AMMONIAC.

AMMONIAC, *(ammoniaca.)* The substance to which this name is given in the new chemical nomenclature, is what was formerly called *volatile sal ammoniac.* It is a gas or fluid resembling air, and has the same transparency and elasticity. It is rather lighter however; its smell is more penetrating, and its taste is acrid and caustic. Hence inflammation of the eyes, catarrhs, &c. are the diseases which those people who are exposed to its action, are subject to, from being near putrid animal substances, urine, &c. in laboratories. This gas, chemists have ascertained to be a compound substance, consisting of hydrogen and azot. Although ammoniac has not yet been employed medicinally in its aëriform state, its componnds are not overlooked. Ammoniac is readily absorbed by water; and when this fluid is saturated with it, it is termed fluor, or caustic volatile alkali, *alkali volatile causticum*, *alkali animale purum*, and in the pharmacopœias, *aqua ammoniæ puræ*. The *sulphate of ammoniac*, a salt formed by the combination of ammoniac with the sulphuric acid, is esteemed for its diuretic and deobstruent qualities, and is described by Bergman under the title of *alkali volatile vitriolatum*, and by Glauber by the name *sal ammoniacum secretum.* Ammoniac and nitric acid form a salt, the nitrate of ammoniac, *nitras ammoniæ*, which possesses irritating, diuretic, and deobstruent virtues, and is described by Bergman under the name of *alkali volatile nitratum;* it is also termed *sal ammoniacus nitrosus*, and *ammonia nitrata.* The direct combination of muriatic acid with ammoniac forms the muriate of ammonia, or sal ammoniac. See AMMONIA MURIATA. Besides these there are the *aqua ammoniæ*, the *aqua ammoniæ acetatæ*, and the *spiritus ammoniæ compositus*, in which the ammoniac is the chief ingredient. See AMMONIA ACETATA, and AQUA AMONIÆ, below, and SPIRITUS AMMONIÆ COMPOSITUS. The researches of chemists have not hitherto exhibited more than one species of volatile alkali. Its formation appears to be owing to putrefaction; and though the distillation of some schisti affords it, yet this circumstance may be attributed to their origin, which is pretty generally ascribed to vegetable and animal decomposition. The prints of fishes which are frequently met with in these substances seem to favour this opinion. Some plants likewise afford volatile alkali; for which reason they have been called *animal plants.* But the volatile alkali is most generally afforded by animal substances; the distillation of all their parts affords it in considerable abundance. Horns are employed in preference, because they are resolved almost entirely into oil and volatile alkali. The putrefaction of all animal substances produces volatile alkali; and in this case, as well as in distillation, it is formed by the combination of its two constituent parts: for analysis very often fails in exhibiting any alkali ready formed, in such parts as distillation or putrefaction would abundantly afford it from. Almost all the volatile alkali made use of either in commerce or medicine, is afforded by the decomposition of sal ammoniac; and it is on account of this circumstance that the chemists who have drawn up the new nomenclature have distinguished the volatile alkali by the name of *ammonia.* In order to obtain ammoniac in a state of considerable purity, equal parts of sifted quick-lime and muriate of ammoniac, or common sal ammoniac in powder, are mixed. This mixture is then introduced into a retort, to which a receiver and the apparatus of Mr. Woulfe have been adapted. A quantity of pure water is then put into the bottles, correspondent to the weight of the salt employed; and the junctures of the vessels are made good with the usual lutes. The ammoniac is disengaged in the state of gas, at the first impression of the fire. It combines with the water with heat; and when the water of the first bottle is saturated, the gas passes to that of the second, and saturates it in its turn.

The volatile alkali is known by its very strong but not disagreeable smell. It is easily reducible into the state of gas, and preserves this form at the temperature of the atmosphere. This gas may be obtained by decomposing the muriate of ammoniac by quick-lime, and receiving the product over mercury. Alkaline gas kills animals, and corrodes the skin; and the irritation is such, that pimples have been observed to arise all over the bodies of birds exposed to its atmosphere. This gas is improper for combustion; but if a taper be gently immersed in it, the flame is enlarged before it goes out, and the gas suffers a decomposition. Alkaline gas is lighter than atmospheric air; and has even been mentioned, on account of its lightness, as a proper substance to fill balloons.

From the experiments of Dr. Priestley, who changed alkaline into hydrogene gas by means of

the electric spark; and those of the chevalier Landriani, who, by passing the same gas through ignited glass tubes, obtained a large quantity of hydrogenous gas, a suspicion of the existence of hydrogene among the principles of alkaline gas was occasioned; but the experiments of Mr. Berthollet seem to have removed the doubts on this subject; and further observations have confirmed the opinion that this alkali is a compound of the nitrogenous and hydrogenous gases. Thus, if the oxigenated muriatic acid be mixed with very pure ammoniac, an effervescence takes place, with a disengagement of nitrogenous gas, a production of water, and a conversion of the oxigenated acid into the ordinary muriatic acid. In this beautiful experiment, the water produced is formed by the combination of the hydrogene of the alkali and the oxigene of the acid; and the nitrogene gas being set at liberty, is dissipated. But when the nitrate of ammoniac is exposed to distillation, nitrogene gas is obtained, and a greater quantity of water is found in the receiver than the salt itself contained. After the operation, the ammoniac is found no longer to exist. The water of the receiver is slightly charged with a small quantity of nitric acid, which had passed over. In this case, the hydrogene of the alkali, and the oxigene of the acid, form the water in the receiver, while the nitrogenous gas, escapes. If the oxides of copper or gold be heated with ammoniacal gas, the product is water and nitrogenous gas, and the metals are reduced. Mr. Chaptal has also observed, that the oxides of arsenic, being digested with ammoniac, are reduced, and often form octahedral crystals of arsenic. In this case there is a disengagement of nitrogene gas, and a formation of water. It also very often happens when metals, such as copper or tin, are dissolved by means of the nitric acid, that an absorption of air takes place, instead of a disengagement of nitrous gas, as might be expected. This phenomenon takes place more especially when a concentrated acid is made use of, and the copper is in fine filings: in this case ammoniac is produced. The ammoniac in this instance is formed by the combination of the hydrogene of the water with the nitrogene gas of the nitric acid; while the oxigene of the same acid, and that of the water, oxidate the metal, and prepare it for solution. It is to a similar cause that we must refer the experiment of Mr. J. M. Haussman of Colmar, who, by passing nitrous gas through a certain quantity of precipitate of iron, in the mercurial apparatus, observed that this gas was speedily absorbed, and the colour of the iron changed; at the same time that vapour of ammoniac was found in the vessels. By a similar theory also the formation of alkaline gas, by the mixture of hepatic and nitrous gas over mercury, may be accounted for, as Mr. Kirwan has observed.

In forming ammoniac, Dr. Austin found that the combination of nitrogenous gas with the base of hydrogene did not take place, unless this last was in a state of great condensation. The formation of ammoniac by distillation and putrefaction, appears likewise to indicate the constituent parts of this substance. In fact, there is in both these operations a disengagement of hydrogene and nitrogene gas, and their combination produces ammoniac. Mr. Berthollet has proved, by the way of decomposition, that one thousand parts of ammoniac, by weight, are composed of about eight hundred and seven of nitrogene gas, and one hundred and ninety-three of hydrogene gas. But according to Dr. Austin, the nitrogene gas is, in proportion to the hydrogene, as one hundred and twenty-one to thirty-two.

Dr. Andrew Duncan represents *ammonia* (the *hydroguret of nitrogen)* to consist, of 80 parts of nitrogene, with 20 of hydrogene. "It exists," he says, "in its purest form, when combined with caloric as a gas, which is perfectly transparent and colourless, and elastic. Its specific gravity is 0.000732. It has a urinous and acrid odour, irritating the nostrils and eyes, and an acrid and caustic taste; does not dissolve animal substances; is irrespirable; extinguishes flame; colours vegetable blues green; and is decomposed by being transmitted through a red-hot tube, and by the electric spark, into its constituent gases; and by oxygen and atmospheric air at a red heat, and by oxy-muriatic acid, it is converted into water and nitrogen gas. It is absorbed without change by porous bodies; it dissolves sulphur and phosphorus; and combines readily with water in all its states. Water is saturated by one-third of its weight of gaseous ammonia, and is thereby increased in bulk, and acquires the specific gravity of 0.905. Ammonia combines with all the acids, forming neutral salts. It is formed during the putrefactive fermentation; and is usually classed with the alkalies."

The preparations of Ammonia are the following:

Aqua Ammoniæ. Edin.

Take of Muriate of ammonia, sixteen ounces;
Quicklime, fresh burnt, two pounds;
Water, six pounds.

Put one pound of the water into an iron or stone vessel, and add the quicklime, previously broken. Cover the vessel and leave it for twenty-four hours, until the lime fall into powder. Put this into a retort, and add to it the muriate of ammonia, dissolved in five pounds of water; and, shutting the mouth of the retort, mix them together by agitation. Lastly, distil into a refrigerated receiver with a very gentle heat, (so that the operator's hand can easily bear that of

the retort), till twenty ounces of liquor are drawn off. In this distillation it is necessary that the vessels be well luted.

This is the *liquor volitilis caustici*, of the Dublin college, with some little difference only in the management of the process. The specific gravity of this liquor is, to that of distilled water, as about 936 to 1000.

Aqua Ammonæ puræ. Lond.

Take of Sal ammoniac, one pound;
Quicklime, two pounds;
Water, one gallon.

Add to the lime two pints of the water. Let them stand together an hour; then add the sal ammoniac and the other six pints of water boiling, and immediately cover the vessel. Pour out the liquor when cold, and distil off, with a slow fire, one pound.

The muriate of ammonia in these cases is decomposed by the lime, in consequence of its having a stronger affinity for muriatic acid than ammonia has. It is absolutely necessary that the lime employed be recently burnt, as the presence of carbonic acid would render the ammonia partially carbonated. This objection is also prevented by the great excess of lime used, which having a greater affinity for carbonic acid than ammonia has, retains any small quantity of it which may exist accidentally. The lime should also be slaked before it is added to the muriate of ammonia, because the heat produced during its slaking would cause violent effects.

Some variation has been made in conducting this process, by Göttling. The peculiarity of his method consists in disengaging the ammonia in the form of gas, and combining it afterwards with water with the assistance of pressure. He uses an earthen ware cucurbit, with a tubulated capital. To the spout of the capital, one end of a bent glass tube is accurately luted, while the other end is introduced to the bottom of a tall narrow-mouthed glass phial, containing one part of water. Into the cucurbit he puts two parts of finely powdered lime, and one of muriate of ammonia, and then applies the heat. He does not shut the tubulature until the smell of ammonia becomes manifest, and opens it again as soon as the process is finished, and before the vessels begin to cool, as otherwise the solution of ammonia would flow back into the cucurbit, and spoil the whole operation. But this management of the tubulature requires very great attention, and, therefore, Dr. Andrew Duncan thinks that this apparatus would be very much improved, by substituting Welter's tube of safety.

These liquid preparations of ammonia are rarely given internally, though, if used in doses of ten to twenty drops, largely diluted, they act as a powerful stimulant in asphyxia, and similar diseases. Externally they are applied to the skin as rubefacients, in the form of gas to the nostrils, and to the eyes as stimulants; in cases of torpor, paralysis, rheumatism, syncope, hysteria, chronic ophthalmia, and such like affections.

The officinal preparations are:—*Hydrosulph. ammon.* Edin.—*Oleum ammon.* Edin. Lond.—*Linim. camph. comp.* Lond.—*Sp. ammon. succin.* Lond.

Alkohol Ammoniatum. Edin.

Take of Diluted alkohol, four pounds;
Muriate of ammonia, four ounces;
Carbonate of potass, six ounces.

Mix them, and draw off by distillation, with a moderate degree of heat, two pounds.

Spiritus Ammoniæ. Lond.

Take of Proof spirit, three pints;
Sal ammoniac, four ounces;
Potass, six ounces.

Mix them, and with a slow fire, draw off one pint and an half.

This is the *Spiritus alkali volatilis*, of the Dublin college.

Another mode of preparing this is the following, which should be preferred as not being attended with loss, either of alkohol or ammonia, and as giving, in fact, both a more active and a more uniform preparation.

Spiritus Ammoniæ. Edin.

Take of Quicklime, sixteen ounnces;
Muriate of ammonia, eight ounces;
Alkohol, thirty-two ounces.

Having bruised and mixed the quicklime and muriate of ammonia, put them into a glass retort; then add the alkohol, and distil to dryness, in the manner directed for the water of ammonia in the foregoing cases.

The Berlin college direct this preparation to be made by simply mixing two parts of alkohol with one of water of ammonia.

The officinal preparations are:—*Alkohol ammon. fœtid.* Edin. Dubl.—*Alkohol ammon. aromat.* Edin. Lond. Dubl.—*Tinct. castor. comp.* Edin.—*Tinct. guaiac. amm.* Edin.—*Tinct. opii ammon.* Edin.

Carbonas Ammoniæ. Edin.

Take of Muriate of ammonia, one pound;
Pure carbonate of lime, (i. e. *chalk*), dried, two pounds.

Rub them separately, mix them thoroughly, and sublime from a retort into a refrigerated receiver.

This is the former *prepared ammonia*, of the Edinb. Pharm.

Ammonia præparata. Lond.

Take of Sal ammoniac, powdered, one pound.
Prepared chalk, two pounds.
Dry them thoroughly; mix, and introduce them into a retort; and sublime the salt into a proper vessel.
This is the *Alkaline volatile nitre* of the Dublin college.

In this process the two substances employed undergo a mutual decomposition, the muriatic acid combining with the lime, and the carbonic acid with the ammonia. Göttling uses three parts of chalk to two of muriate of ammonia, but he dries his chalk before he weighs it, as the presence of moisture injures the product. The ingredients are to be thoroughly mixed by trituration, before they are introduced into the retort, that no part of the muriate of ammonia may escape decomposition; and we are even sometimes directed to cover the furface of the mixture, after they are in the retort, with powdered chalk. Carbonate of lime does not act on muriate of ammonia till a considerable heat be applied. Göttling says, that the sublimation must be conducted in the open fire, and therefore uses an earthen-ware cucurbit, with a tubulated capital.

The carbonate of ammonia thus obtained is in the form of a white crystallized mass, of a fibrous texture, having the smell and taste of ammonia, but weaker. It is soluble in twice its weight of cold water, but more soluble as the temperature of it is increased. Yet when it approaches to boiling, the carbonate is volatilized. It is said to vary very much in its composition, and to contain more ammonia, and less acid and water, in proportion to the high temperature employed in preparing it, the quantity of alkali varying from 50 to 20 *per cent.* It is decomposed by most of the acids, and all the alkaline, and some of the earthy, bases.

The medical uses of carbonate of ammonia are exactly similar to those of ammonia, but weaker. It is principally used as smelling salts in syncope and hysterical affections.

The officinal preparations are: *Aqua acetitis ammon.* Edin. Lond. Dubl. *Ammoniaretum cupri*, Edin. Lond. Dubl.

Aqua Carbonatis Ammoniæ. Edin.

Take of Muriate of ammonia;
Carbonate of potass, each sixteen ounces;
Water, two pounds.
Mix the salts, and put them into a glass retort; pour the water upon them, and distil to dryness in a sand-bath, gradually increasing the heat applied.
Draw the liquor off by distillation, till the residuum is left dry.

The Dublin college state the specific gravity of this liquor to that of distilled water, as 1110 to 1000. It is named by them *liquor alkali volatilis.*

Aqua Ammoniæ. Lond.

Take of Muriate of ammonia, one pound;
Potass, one pound and a half;
Water, four pints.
Gradually draw off two pints by distillation.

A solution of carbonate of ammonia is thus obtained, while the residuum in the retort is muriate of potass. In this instance, the decomposition of the muriate of ammonia cannot be effected by carbonate of lime, because the addition of the water prevents the application of the necessary heat, whereas carbonate of potass acts at a moderate temperature. The London college differs from the other colleges in regard to the quantity of water added, and in the proportion of carbonate of potass employed; and certainly the addition of more water than is to be drawn off by distillation, must increase the size of the apparatus employed, an inconvenience which should be avoided, if possible. It is more economical to prepare the solution by dissolving a certain proportion of the carbonate of ammonia in water.

The officinal preparations are these:—*Oxid. hyd. ciner.* Edin. Dubl. *Linim. camphoris*, Dubl. *Pil. ammoniaret. cupri*, Edin. *Linim. Amm.* Phar. Chir.

AMMONIACUM, (αμμονιακον; so called from *ammonia*, the country from whence it was originally brought). It is the *gum ammoniac*, a concrete gummi-resinous juice, brought from the East Indies, usually in large masses, composed of little lumps or tears, of a milky colour, but soon changing, upon being exposed to the air, of a yellowish hue. We have no certain account of the plant which affords this juice. The seeds usually found among the tears resemble those of the umbelliferous class. It has however been said to be an exudation from a species of ferula. Such tears as are large, dry, free from little stones, seeds, or other impurities, should be picked out, and preferred for internal use; the coarser kind is purified by solution and colature, afterwards carefully inspissating it. Unless this be artfully managed, the gum will lose a considerable deal of its more volatile parts. There is often vended in the shops, under the name of strained gum ammoniacum, a composition of ingredients much inferior in virtue.

Ammoniacum has a nauseous sweet taste, followed by a bitter one; and a peculiar smell somewhat like that of galbanum, but more grateful. It softens

in the mouth, and grows of a whiter colour upon being chewed. Thrown upon live coals, it burns away in flame: it is in some measure soluble in water and in vinegar, with which it assumes the appearance of milk; but the resinous part, amounting to about one half, subsides, on standing.

Ammoniacum is a useful deobstruent; and frequently prescribed in diseases of the abdominal viscera, and in hysterical disorders occasioned by a deficiency of the menstrual evacuations. It is likewise supposed to stimulate the pulmonary vessels, and proves of considerable service in some kinds of asthma where the lungs are oppressed by viscid phlegm: in this intention, a solution of gum ammoniacum in vinegar of squills proves a medicine of great efficacy, though not a little unpleasant. In long and obstinate cholics, proceeding from morbid matter lodged in the intestines, this gum-resin has produced happy effects, after purges and the common carminatives had been used in vain. Ammoniacum is most commodiously taken in the form of pills: about a scruple may be given every night, or oftener. Externally, it softens and ripens hard tumors: a solution of it in vinegar stands recommended by some for resolving even schirrous swellings. A plaster made of ammoniacum and squill vinegar, is recommended as proper in white swellings—a dilute solution of the same is likewise rubbed on the parts as a liniment. Notwithstanding all this, Dr. Cullen thinks its antispasmodic power inconsiderable, and its expectorant and resolvent very doubtful.

Ammoniaci Purificatio. Lond.

If gum ammoniac be impure, boil it in water till it become soft; then squeeze it through a coarse canvas bag, by the help of a press. Let it remain at rest till the resinous part subside; then evaporate the water; and towards the end of the evaporation, mix the resinous part with the gummy very completely.

In the same manner are purified *assa fœtida* and similar *gum-resins*. Any other gum which melts easily, such as *galbanum*, *&c.* may be purified by putting it in an ox-bladder, and holding it in boiling water till it become so soft that it can be separated from its impurities by straining.

An objection to this is, that one, perhaps the most active, constituent of gummy resins, being of a volatile nature, this part of it must be in a great measure dissipated in the process just described. We cannot therefore expect the same virtues in these substances after they are purified, which they possess in their crude state. This process is therefore contrary to the principles of good pharmacy. Besides, many of the impurities which they usually contain, are easily separated in compounding the preparations or extemporaneous prescriptions into which they enter, and therefore had better be allowed for in the dose prescribed.

Lac Ammoniaci. Lond. Dubl.

Take of Gum ammoniac, two drachms;
Distilled water, half a pint.

Rub the gum-resin with the water, gradually poured on, until the former is dissolved.

The officinal preparations of ammoniacum are these:—*Ammon. purif.* Lond. *Lac Ammon.* Lond. Dubl. *Pil. scillæ*, Lond. Edin. Dubl. *Empl. gum*, Edin. *Empl. Ammon. cum hydrag.* Lond.

AMMONIS CORNU; Ammon's horn; a fossil found of different colours, but most frequently that of an ash, and in shape resembling the horn of a ram. It receives its name from the custom of consecrating rams-horns in the temple of Jupiter Ammon, in the desarts of Libya.

AMO'MUM, (from an Arabic word signifying *a pigeon*, whose foot it was thought to resemble); the herb popularly named *stone-parsley*. Of this botanists have enumerated three species, viz. the true, the bastard, and a third sort, the *tree night-shade*, is included. The *amomum verum* is also called *amomum racemosum; true amomum*, or *true stone-parsley*. The fruit is about the size of a grape. The seed is the only part that is considered as medicinal, but it is not known whether the true *amomum* of the ancients exists or not. The most probable account is that of Gamelli, in the Philosophical Transactions. He says, that the *tugus*, called by some *birao*, and by others *caropi*, is the *genuine amomum* of Dioscorides.

Many confound the *amomum* with great cardamom. See Cardamomum. It is a native of China. In Armenia the amomus is substituted for the amomum. The college of Edinburgh supply the place of the amomum verum with the caryoph. aromat. The college of London have rejected it.

The *amomum vulgare* is also called Germanicum, *sium aromaticum*, *&c. bastard stone-parsley;* the *amomum* of Linnæus. This is a perennial plant, which grows wild under moist hedges and by the sides of ditches: it flowers in July, and its seeds, which are the only part used in medicine, are ripe in August. They have a light agreeable smell, and a warm aromatic taste; and are esteemed carminative and diuretic. They are not so hot and pungent as, by the best accounts, the seeds of the *true amomum* are, nor is their flavour of the same kind. They give over all their properties with water in distillation; but by boiling in an open vessel, their virtue is soon dissipated. By way of tincture they give out their virtue to spirit of wine.

The virtues of the third sort are mentioned above, the same as those of common night-shade.

AMOMUM CARDAMOMUM; the systematic name for the *cardamomum minus*. See Cardamomum minus.

AMOMUM GRANUM PARADISI, the systematic name of the plant which affords the grains of paradise. See Grana Paradisi.

AMOMUM ZINGIBER; the systematic name of a plant which supplies ginger. See Zingiber.

AMNESIA, (from α, priv. and μνησις, *memory*), also called *amnestia;* forgetfulness, mostly a symptomatic affection arising from a paralytic cause.

AMNESTIA, (αμνηστια; from α, priv. and μνηστις, *memory*); *forgetfulness;* absence of mind. See Amnesia.

AMNIOS, or AMNION, (from αμνιον, a vessel which the ancients used for the reception of blood in sacrifices); the innermost membrane of the membranaceous ovum of the fœtus. It is a fine, thin, transparent membrane, soft, but tough, smooth on its inside, but rough on the outer.—Dr. Hunter says, that it runs over the internal surface of the placenta, and that this membrane, which seems not vascular in the human subject, makes the external covering of the navel-string, to which it is most firmly united; and that, viewed in a microscope, it appears to have blood-vessels, but in fact they are lymphatics.

However the existence of the allantois may be disputed in the human subject, the *amnion* is found in all animals both viviparous and oviparous. See Allantois.

AMPELITES, cannel-coal, a hard, opaque, fossil, inflammable substance, of a black colour. It does not effervesce with acids. The ampelites, though much inferior to jet in many respects, is yet a very beautiful fossil; and for a body of so compact a structure, remarkably light. Examined by the microscope, it appears composed of innumerable very small and thin plates, laid closely and firmly on one another; and full of very small specks of a blacker and more shining matter than the rest, which is evidently a purer bitumen than the general mass. These specks are equally diffused over the different parts of the masses. There is a large quarry of it near Alençon in France. It is dug in many parts of England, but the finest is in Lancashire and Cheshire; it lies usually at considerable depths. It makes a very brisk fire, flaming violently for a short time, and after that continuing red and glowing hot a long while; and finally is reduced into a small proportion of grey ashes, the greater part of its substance having flown off in the burning.—It is capable of a very high and elegant polish; and, in the countries where it is produced, is turned into a vast number of toys, as snuff-boxes and the like, which bear all the nicety of turning, and are made to pass for jet.—Husbandmen dress their vines with it, as it kills the vermin which infests them. It is likewise used for the dyeing of hair black. In medicine, it is reputed good in colics, against worms, and of being in general an emollient and discutient; but the present practice takes no notice of it.

AMPHEMERINOS, (αμφημερινος, from αμφι, *about*, and ημερα, *a day*). See Amphimerina.

AMPHIMERINA CARDIACA, a species of remitting tertian fever mentioned by Sauvages. It is an acute malignant fever, having daily exacerbations, attended with fainting and vomiting of green bile. Afterwards, the weakness increasing, the patient's extremies grow cold, and a profuse sweat comes on, which is frequently succeeded by death on the fourth day. Another species resembling this, Sauvages calls the *syncopalis;* but the cardiaca differs from it in being attended with cardialgia.

AMPHIMERINA PALUDOSA, the systematic name given by Sauvages to a species of tertian fever described by the British physicians under many different names, and appearing under various forms, according to the different constitutions of patients, in tropical regions. This fever, in the East Indies, generally comes on suddenly, and begins with a sense of debility and a very great lowness of spirits. These symtoms are attended with a greater or less degree of chilness, a dizziness, a nausea, very acute pains in the head and loins, and a trembling of the hands: the countenance is pale, the skin commonly very dry and corrugated, the eyes dull and heavy, the pulse quick and small, the breath generally difficult, and interrupted with hiccough.

As the paroxysm increases, the chilness now and then gives way to irregular heats, which soon become violent and permanent; the nausea likewise increases; and in some there comes on a vomiting, in which they throw up a great deal of bile. Sometimes bile is likewise voided by stool. The skin grows red, the eyes small, and sometimes not a little inflamed. The pulse becomes fuller, and the breath more difficult, attended with great restlessness and a troublesome thirst; notwithstanding which (so great is the nausea) the patient cannot endure any kind of liquids. The tongue becomes foul, and the pain of the head and loins more violent; a delirium then follows; a slight moisture appears on the face, and from thence spreads to the other parts; whilst the violence of the other symptoms abates, and shows the beginning of a remission, which is completed by plentiful sweats.

On the fever's remitting, the pulse returns almost to its natural state; the pains of the head and loins still continue, though somewhat less violent, as likewise the nausea and want of appetite. When the disease gains strength the remission is scarcely obvious, and is immediately followed by another paroxysm; which begins, not indeed with so great a shivering, but is attended with a greater pain of the head, the greatest anxiety, a heartburn, nausea, vomiting, and bilious stools. The matter most

commonly evacuated by vomit and stool is whitish like chalk and water, or curdled milk which is vomited by sucking children, when the curd is much broke down. A heat, immoderate thirst, and delirium, now come on. The tongue becomes more foul; the teeth and inside of the lips are covered with a black crust; the breath grows hot and fetid: another remission ensues, attended with a sweat; but this remission is both shorter and less obvious than the first.

This second remission is succeded by a paroxysm, in which the symptoms are far more violent than the former; that which the patient discharges by vomiting and purging is more fetid: the mouth, teeth, and inside of the lips, are not only covered with a black crust, but the tongue becomes so dry and stiff, that the patient's voice can scarce be heard. Violent delirium, with restlessness and anxiety, come on chiefly during the paroxysm; nor do these symptoms abate till the fever remits, and the patient sweats.

When the fever becomes so violent, during the third fit, as to end in death, which is generally the case, some of the sick have a coma; in others the delirium becomes more violent. The discharges now become more fetid, and have a cadaverous smell; the stools are involuntary; the pulse is so quick, small, and irregular, that it is scarce to be counted, or even felt; a cold sweat is diffused over the whole body, especially the head and neck: the face becomes Hippocratic and convulsed; the patient picks the bed-clothes; a subsultus tendinum comes on; the sick lie constantly on their backs, and insensibly slide down to the foot of the bed; their extremities grow cold; they are then seized with convulsions, with which the scene closes.

In this fever, the urine, which at the beginning is pale, becomes of a deeper colour by degrees, but without depositing any sediment. There seldom or never appear any petechiæ, and the prickly heat, which was before on the skin, vanishes on the first appearance of the fever. But though these were the general symptoms of this disorder, they varied in the different subjects, and at different seasons of the same year. The pulse, for example, in some, was quick in the disorder; in others, it varied with the other symptoms. The skin was generally dry in the beginning of the fit; but in some it was moist, and covered with sweat from the very first beginning of the disease. In the month of September, when the disorder raged most, the remissions were very imperfect and obscure; but, on the return of winter and the healthy season, they became more regular, and the disease assumed the appearance of an intermitting fever, to such a degree as at length not to be distinguished from it. In some the remissions could scarce be perceived, and the fever continued for two weeks without any material change for the better or the worse. At this time numbers were seized with it. When the disorder continued for any time without a change, it generally ended in death; while the weather grew better, it sometimes, in the space of a few days, from a common fever became an intermitting one, and the patient recovered, unless his liver, which was sometimes the case, happened to be affected. The cure of an inflammation of the liver proved uncertain and tedious; as it was commonly followed by a colliquative diarrhœa, which generally endangered the patient's life.—Every succeeding paroxysm was observed to be more dangerous than the preceding; the third generally proved fatal; some died during the first. When this happened, the fever, in the language of the country, was called a *puca*, that is, a strong fever.

This disease, according to Dr. Lind of Haslar hospital, is the autumnal fever of all hot countries, the epidemic disease between the tropics, and the disease most fatal to Europeans in all hot and unhealthy climates. All authors agree that intermittents in general, but particularly this dangerous kind of them, are produced by heat and moisture. Dr. Lind of Windsor remarks, that the European seamen are very subject to the fever above mentioned when they happen to arrive at Bengal in autumn. They are predisposed to it from the nature of their food, their confinement on board, the very great heats to which they are exposed during the voyage, and their lying for hours together exposed to the night colds.

Most of the meat used by the crews of those ships is salted, and often in a putrid state, without any fresh vegetables, they having only biscuits, and some other farinaceous matters. The quantity of the vinous or spirituous liquors allowed them is by far too small to subdue the putrescent disposition of their animal-food. Their fluids consequently become, from day to day, more and more putrescent, and of course the more apt to breed and contract this disorder. This disposition is likewise induced by their being stowed very close together, and that for a considerable length of time, and in a foul air, especially when the weather happens to be too stormy to permit the hatches and port-holes to be kept open.

Though the heats they endure in the voyage to India are less considerable than those of the country itself, yet they are too much for an European constitution to bear. The general heat at sea within the tropics is about 84° of Fahrenheit's thermometer, which is sufficient to relax them, and promote a corruption of their humors, especially when it coincides with the above causes. It likewise creates a languor and indolence, which alone are sufficient to increase that putrescence. These causes are apt to be considerably aggravated by the men being often exposed, when on duty, for hours together, to rain, damp, and cold air; a circumstance which frequently happens to them when

working their ships up the river Ganges in the night-time. Hence the perspiration is checked, and the excrementitious fluid, which used to be discharged by the skin, being retained in the body, contributes, he thinks, very much towards the predisposition to this disease.

But the most powerful of all the remote causes is justly thought to be the effluvia of marshes replete with various putrid substances. See Marsh Miasmata. We have not, however, been able to determine from what particular kind of putrid substances these effluvia derive their virus. For that every kind of putrefaction has not such an effect appears from this, that neither practical anatomists, nor those who by their trades are exposed to the putrid effluvia of animals, for instance, such tanners and butchers as keep their shops and stalls very dirty, are more subject than others to putrid diseases. Nor are the ship-stewards and their servants, whose business it is to deliver out their provisions to the ships' crews, and who spend the most of their time amongst the putrid and rancid effluvia of the places in which those provisions are kept, more subject to putrid fevers than their ship-mates. But whatever be in this, we are well assured that some particular putrid fermentations produce noxious vapours, which, united with those of marshes, render them more pernicious. Hence evidently proceeds the extreme unhealthfulness of a place called *Culpi*, on the eastern bank of the Ganges. The shores about it are full of mud, and the banks covered with trees. Opposite to the place where the ships lie, there is a creek, and about a mile from its entrance stands the town of Culpi: the ships lie about a mile from the shore. None of the sailors on board the ships stationed at this place enjoyed their health. The burying ground also contributed not a little to spread the infection. The ground being marshy, the putrid water flowed from the old graves into the new ones, which infected the grave-diggers and those that attended the funerals; and from this cause many were suddenly seized while they were performing the last duty to their companions. This place has ever been remarkable for the unhealthfulness of its air. It was once customary to send some of the Company's servants here to receive the cargoes of the ships, and send them to Calcutta; but so many of them died on this duty, that the Company was at length obliged to dispense with it.

Hence it plainly appears, how apt putrid animal and vegetable substances are to render the effluvia of fenny places more pernicious than they would otherwise be. The reason why great inundations of the Nile and Ganges are followed by a healthy season is, that by this means the putrid animal and vegetable substances dispersed over the contiguous countries are carried off into the sea.—The noxious vapours arising from fens spread but a little way. Dr. Lind has often known ships' crews at a very little distance from the shore quite free from this disorder. But although these marsh miasmata first bring on the disease, yet contagion particularly spreads it, and renders it more epidemic. Thus the Drake East Indiaman continued free from the disorder for two weeks together, when she had no communication with the other ships; whereas, as soon as the disorder was brought on board, many were seized with it within a few days, in such a manner as to leave no room to entertain the least doubt concerning its pestilential nature.

Dr. Lind, of Haslar hospital, has given a very curious and learned account of the appearance of this fever throughout the various parts of the globe. It was very common in England in the years 1765 and 1766, one obvious cause of which was the prevalence of the eastern wind. This wind in England is often said to bring with it a fog from the sea; but the truth of the matter is, that in many places of this island the east wind frequently raises a copious vapour from water, mud, and all marshy or damp places. To this exhaling quality of the easterly wind Dr. Lind has often been an eye-witness. When the wind changes to the east, the mud sometimes sends up a vapour as thick as smoke; and the doctor has observed two fish-ponds in his neighbourhood, one of fresh and the other of salt water, which on the approach of an easterly wind sometimes also emit a dense vapour, as from a pot of boiling water. In order to view this phenomenon distinctly, the person should stand at about 100 yards distance from the mud or ponds. If the sun shines when the wind changes to the east, he will observe a constant steam of vapours arising out of the ponds, from five to ten yards in height, while the air about him remains serene. As the vapour or fog arising from other bodies glides along the surface of the earth, and is brought by the easterly wind to the ponds, he will still be able, for some time, to distinguish the vapours ascending perpendicularly out of the ponds from those which are carried in an horizontal direction by the wind; especially if the sun continues to shine, though faintly.

This evaporating quality of the east-wind seems to manifest itself also by its effects both on the thermometer and the human body; for a thermometer hung over a damp piece of ground during the fogs or exhalations arising from it, will often indicate a degree of cold below the freezing point. The chillness of the body, so sensibly perceived when in this situation, seems to proceed from the same cause, and to produce nearly the same sensations, which the damp arising from the wet floor in a chamber communicates to those who happen to be in it.

Winds are not constant in their effects. As we we have sometimes warm weather with a north

wind, and sometimes very little heat with one blowing from the south; so the fogs attending an east wind are not constant, neither is the evaporation above mentioned at all times to be perceived. It is possible however, that in all this there may be a deception; and that instead of supposing the quantity of vapours exhaled to be increased by an easterly wind, the coldness of that wind may only condense and render visible the vapours in the air at that time. But even this supposition is liable to great objections, as our coldest north winds seldom or never produce such an effect, but on the contrary are attended with dry and serene weather.

Be this as it will, however, an east wind is usually accompanied with a cold, damp, and unwholesome vapour, which is observed to effect the health both of animals and vegetables, and in many places to produce obstinate intermitting fevers, and also to occasion frequent relapses. In particular spots of the low damp island of Portsea, the ague frequently prevails during the autumnal season, and in some years is much more frequent and violent than others. It is also observable, that this disease always attacks strangers, or those who have formerly lived on a drier soil, and in a more elevated situation, with greater severity than those who are natives of the island.

The year 1765 was remarkable, not only for the long continuance of the easterly winds, but for an excessive degree of heat, which produced a more violent and general rage of those diseases than had been known for many years before. In the month of August the quicksilver in Fahrenheit's thermometer often rose to 82° in the middle of the day. This considerable addition of heat, together with the want of refreshing rains, greatly spread the fever, increased its violence, and even changed its form in many places. At Portsmouth, and throughout almost the whole island of Portsea, an alarming continual or remitting fever raged, which extended itself as far as Chichester. At the same time, the town of Gosport, though distant only one mile from Portsmouth, enjoyed an almost total exemption from sickness of every kind; whereas in the neighbouring villages and farm houses, a mild regular tertian ague distressed whole families. The violence of the fever, with its appearances in a continued, remitting, or intermitting form, marked in some measure the nature of the soil. In Portsmouth the symptoms were bad, worse at Kingston, and still more dangerous and violent at a place called *Half-way Houses;* a street so named, about half a mile from Portsmouth, where scarcely one in a family escaped this fever, which generally made its first attack with a delirium. In the large suburb of Portsmouth called the *Common*, it seemed to rage with more violence than in the town, some parts excepted; but even whole streets of this suburb, together with the houses in the dock-yard, escaped its attack.

The marines, who were three times a-week exercised early in the morning on South-Sea beach, suffered much from the effect of the stagnant water in an adjoining morass. Half a dozen of them were frequently taken ill in their ranks when under arms: some being seized with such a giddiness of their head, that they could scarcely stand; while others fell down speechless, and upon recovering their senses complained of a violent head-ach. When such patients were received into the hospital, it was observed that some few had a regular ague, but that far the greater number laboured under a remitting fever, in which sometimes indeed there was no perceptible remission for several days. A constant pain and giddiness of the head were the most inseparable and distressing symptoms of this disease. Some were delirious, and a few vomited up a quantity of bile; but in all the countenance was yellow. A long continuance of the fever produced a dropsy or jaundice, or both. Even a slight attack reduced the most robust constitution to a state of extreme debility; and this weakness, together with the giddiness, continued for a long time after the fever. A scabby eruption now and then made its appearance on the lips and the corners of the mouth: but dry itchy spots over the whole body, resembling much the common itch, and seeming to partake of the nature of that disease, were more frequently observed in the patients at Portsmouth, where there was not the least reason to suspect any infection.

Such is the appearance of this extraordinary species of remitting fever in England. In the Netherlands and many other foreign parts its symptoms are not much different. Dr. Lind's accounts of some of the most distinguishing appearances with which it was accompanied in different climates, together with the plans of cure adopted under different circumstances, will be considered under the article REMITTING TERTIAN.

AMPHIARTHRO'SIS, a mixed sort of articulation partaking of *diarthrosis* and *synarthrosis;* it resembles the first in being moveable, and the latter in its connexion. The pieces which compose it have not a particular cartilage belonging to each of them, as in the diarthrosis, but they are both united to a common cartilage, which being more or less pliable, allows them certain degrees of flexibility, though they cannot slide upon each other: such is the connexion of the first rib with the *sternum*, and of the bodies of the *vertebræ* with each other.

AMPHIBIA, in zoology, the name of Linnæus's third class of animals; including all those which live partly in water and partly on land. This class he subdivides into four orders, viz. the am-

phibia reptiles; the amphibia serpentes; the amphibia nantes; and the amphibia meantes.

It has been a question, Whether the animals commonly called amphibious, live most in the water or on land. If we consider the words αμφι (*utrinque*, both ways), and βιος (*vita*, life), from which the term amphibious is derived; we should understand that animals, having this title, should be capable of living as well by land, or in the air, as by water; or of dwelling in either constantly at will: but it will be difficult to find any animal that can fulfil this definition, as being equally qualified for either. Dr. Parsons, in a paper read before the Royal Society in 1767, from considering their œconomy respectively, divides them into two orders, viz. 1. Such as enjoy their chief functions by land, but occasionally go into the water. 2. Such as chiefly inhabit the water but occasionally go ashore. What he advances on this subject is curious, and will shew the nature of this class.

(1.) Of the first order, he particularly considers the phocæ; and endeavours to shew, that none of them can live chiefly in the water, but that their chief enjoyment of the functions of life is on shore.

These animals (he observes) are really quadrupeds; but, as their chief food is fish, they are under a necessity of going out to sea to hunt their prey, and to great distances from shore; taking care that, however great the distance, rocks or small islands are at hand, as resting-places when they are tired, or when their bodies become too much macerated in the water; and they return to the places of their usual resort to sleep, copulate, and bring forth their young, for the following reasons, viz. It is well known, that the only essential difference, as to the general structure of the heart, between amphibious and mere land animals, or such as never go into the water, is, that in the former the oval hole remains always open. Now, in such as are without this hole, if they were to be immersed in water for but a little time, respiration would cease, and the animal must die; because a great part of the mass of blood passes from the heart by the pulmonary artery through the lungs, and by the pulmonary veins returns to the heart, while the aorta is carrying the greater part of the mass to the head and extremities, &c.

Now, the blood passes through the lungs in a continual uninterrupted stream, while respiration is gentle and moderate; but, when it is violent, then the circulation is interrupted, for inspiration and exspiration are now carried to their extent; and in this state the blood cannot pass through the lungs either during the total inspiration or total exspiration of the air in breathing: for, in the former case, the inflation compresses the returning veins; and in the latter, by the collapsion of the lungs, these veins are interrupted also; so that it is only between these two violent actions that the blood can pass: and hence it is that the lives of animals are shortened, and their health impaired, when they are subjected to frequent violent respiration; and thus it is, that, when animals have once breathed, they must continue to respire ever after, for life is at an end when that ceases.

There are three necessary and principal uses of respiration in all land-animals, and in those kinds that are counted amphibious.—The first is, that of promoting the circulation of the blood through the whole body and extremities. In real fishes, the force of the heart is alone capable of sending the blood to every part, as they are not furnished with limbs or extremities; but in the others mentioned, being all furnished with extremities, respiration is an assistant force to the arteries in sending blood to the extremities, which, being so remote from the heart, have need of such assistance, otherwise the circulation would be very languid in these parts: thus we see, that, in persons subject to asthmatic complaints, the circulation grows languid, the legs grow cold and œdematous, and other parts suffer by the defect in respiration.—A second use of breathing is, that, in inspiration, the variety of particles, of different qualities, which float always in the air, might be drawn into the lungs, to be insinuated into the mass of blood, being highly necessary to attemper and cool the agitated mass, and to contribute refined pabulum to the finer parts of it, which, meeting with the daily supply of chyle, serves to assimilate and more intimately mix the mass, and renders its constitution the fitter for supporting the life of the animal. Therefore it is, that valetudinarians, by changing foul or unwholesome air, for a free, good, open air, often recover from lingering diseases.—A third principal use of respiration is, to promote the exertion of voice in animals; which all those that live on the land do according to their specific natures.

From these considerations it appears, that the phocæ of every kind are under an absolute necessity of making the land their principal residence. But there is another very convincing argument why they reside on shore the greatest part of their time; namely, that the flesh of these animals is analogous to that of other land animals; and therefore, by over long maceration, added to the fatigue of their chacing their prey, they would suffer such a relaxation as would destroy them. It is well known, that animals, which have lain long under water, are reduced to a very lax and unhealthy state: thus the phocæ must bask in the air on shore; for, while the solids are at rest, they acquire their former degree of tension, and the vigor of the animal is restored; and, while he has

an uninterrupted placid respiration, his blood is refreshed by the new supply of air, as explained above, and he is rendered fit for his next cruise: for action wastes the most exalted fluids of the body, more or less, according to its duration and violence; and the restorative rest must continue a longer or shorter time, according to the quantity of the previous fatigue.

Let us now examine by what power these animals are capable of remaining longer under water than land-animals.

All these have the oval hole open between the right and left auricles of the heart; and, in many, the canalis arteriosus also: and while the phoca remains under water, which he may continue an hour or two more or less, his respiration is stopped; and the blood, not finding the passage through the pulmonary artery free, rushes through the hole from the right to the left auricle, and partly through the arterial canal, being a short passage to the aorta, and thence to every part of the body, maintaining the circulation: but, upon rising to come ashore, the blood finds its passage again through the lungs the moment he respires.

Thus the fœtus in utero (see FŒTUS), during its confinement, having the lungs compressed, and consequently the pulmonary arteries and veins impervious, has the circulation of the blood carried on through the oval hole and the arterial canal. Now, so far the phoca in the water, and the fœtus in utero, are analogous; but they differ in other material circumstances. One is, that the fœtus, having never respired, remains sufficiently nourished by the maternal blood circulating through him, and continues to grow till the time of his birth, without any want of respiration during nine months confinement: the phoca, having respired the moment of its birth, cannot live very long without it, for the reasons given before; and this hole and canal would be closed in them, as it is in land-animals, if the dam did not, soon after the birth of the cub, carry him so very frequently into the water to teach him; by which practice these passages are kept open during life, otherwise they would not be capable of attaining the food designed for them by Providence.

Another difference is, that the phoca, as was said before, would be relaxed by maceration in remaining too long in the water; whereas the fœtus in utero suffers no injury from continuing its full number of months in the fluid it swims in: the reason is, that water is a powerful solvent, and penetrates the pores of the skins of land-animals, and in time can dissolve them; whereas the *liquor amnii* is an insipid soft fluid, impregnated with particles more or less mucilaginous, and utterly incapable of making the least alteration in the cutis of the fœtus.

Otters, beavers, and some kinds of rats, go occasionally into the water for their prey, but cannot remain long under water, "I have often gone to shoot otters (says our author) and watched all their motions: I have seen one of them go softly from a bank into the river, and dive down; and in about two minutes rise, at ten or fifteen yards from the place he went in, with a middling salmon in his mouth, which he brought on shore: I shot him, and saved the fish whole." Now, as all fœtuses have these passages open, if a whelp of a true water-spaniel was, immediately after its birth, served as the phoca does her cubs, and immersed in water, to stop respiration for a little time every day, it is probable that the hole and canal would be kept open, and the dog be made capable of remaining as long under water as the phoca.

Frogs, how capable soever of remaining in the water, yet cannot avoid living on land, for they respire; and, if a frog be thrown into a river, he makes to the shore as fast as he can.

The lizard kind, such as may be called water-lizards, are all obliged to come to land, in order to deposit their eggs, to rest, and to sleep. Even the crocodiles, who live much in rivers, sleep and lay their eggs on shore; and, while in the water, are compelled to rise to the surface to breathe: yet, from the texture of his scaly covering, he is capable of remaining in the water longer by far than any species of the phoca, whose skin is analogous to that of a horse or cow.

The hippopotamus, who wades into the lakes or rivers, is a quadruped, and remains under the water a considerable time; yet his chief residence is upon land, and he must come on shore for respiration.

The testudo, or sea-tortoise, though he goes out to sea, and is often found far from land; yet, being a respiring animal, cannot remain long under water. He has indeed a power of rendering himself specifically heavier or lighter than the water, and therefore can let himself down to avoid an enemy or a storm: yet he is under a necessity of rising frequently to breathe, for reasons given before; and his most usual situation, while at sea, is upon the surface of the water, feeding upon the various substances that float in great abundance every where about him; these animals sleep securely upon the surface, but not under water; and can remain longer at sea than any other of this class, except the crocodile, because, as it is with the latter, his covering is not in danger of being too much macerated; yet they must go on shore to copulate and lay their eggs.

(2.) The consideration of these is sufficient to inform us of the nature of the first order of the class of amphibious animals: let us now see what is to

be said of the second in our division of them, which are such as chiefly inhabit the waters, but occasionally go on shore.

These are but of two kinds: the eels, and water serpents or snakes of every kind. It is their form that qualifies them for loco-motion on land, and they know their way back to the water at will; for, by their structure, they have a strong peristaltic motion, by which they can go forward at a pretty good rate: whereas all other kinds of fish, whether vertical or horizontal, are incapable of a voluntary loco-motion on shore; and therefore, as soon as such fish are brought out of the water, after having flounced a while, they lie motionless, and soon die.

Let us now examine into the reason why these vermicular fish, the eel and serpent kinds, can live a considerable time on land, and the vertical and horizontal kinds die almost immediately when taken out of the water: and, in this research, we shall come to know what analogy there is between land animals and those of the waters. All land-animals have lungs, and can live no longer than while these are inflated by the ambient air, and alternately compressed for its expulsion; that is, while respiration is duly carried on, by a regular inspiration and exspiration of air.

In like manner, the fish in general have, instead of lungs, gills, or branchiæ: and, as in land-animals the lungs have a large portion of the mass of blood circulating through them, which must be stopped if the air has not a free ingress and egress into and from them; so, in fish, there is a great number of blood-vessels that pass through the branchiæ, and a great portion of their blood circulates through them, which must in like manner be totally stopped, if the branchiæ are not perpetually wet with water. So that, as the air is to the lungs in land-animals a constant assistant to the circulation; so is the water to the branchiæ of those of the rivers and seas: for, when these are out of the water, the branchiæ very soon grow crisp and dry, the blood-vessels are shrunk, and the blood is obstructed in its passage; so, when the former are immersed in water, or otherwise prevented from having respiration, the circulation ceases, and the animal dies.

Again, as land-animals would be destroyed by too much maceration in water; so fishes would, on the other hand, be injured by too much exsiccation; the latter being, from their general structure and constitution, made fit to bear, and live in, the water; the former, from their constitution and form, to breathe and dwell in the air.

But it may be asked, Why eels and water-snakes are capable of living longer in the air than the other kinds of fish? This is answered, by considering the providential care of the great Creator for these and every one of his creatures; for, since they were capable of loco-motion by their form, which they need not be if they were never to go on shore, it seemed necessary that they should be rendered capable of living a considerable time on shore, otherwise their loco-motion would be in vain. How is this provided for? Why, in a most convenient manner: for this order of fishes have their branchiæ well covered from the external drying air; they are also furnished with a slimy mucus, which hinders their becoming crisp and dry for many hours; and their very skins always emit a mucous liquor, which keeps them supple and moist for a long time: whereas the branchiæ of other kinds of fish are much exposed to the air, and want the slimy matter to keep them moist. Now, if any of these, when brought out of the water, were laid in a vessel without water, they might be preserved alive a considerable time, by only keeping the gills and surface of the skin constantly wet, even without any water to swim in.

It has been advanced, that *man* may, by art, be rendered amphibious, and able to live under water as well as frogs. As the fœtus lives *in utero* without air, and the circulation is there continued by means of the foramen ovale; by preserving the passage open, and the other parts *in statu quo*, after the birth, the same faculty would still continue. Now, the foramen, it is alleged, would be preserved in its open state, were people accustomed, from their infancy, to hold their breath a considerable time once a day, that the blood might be forced to resume its pristine passage, and prevent its closing up, as it usually does. This conjecture seems, in some measure, supported by the practice of divers, who are taught from their childhood to hold their breath, snd keep long under water, by which the ancient channel is kept open. —A Calabrian monk at Madrid laid claim to this amphibious capacity, making an offer to the king of Spain, to continue twice twenty-four hours under water, without ever coming up to take breath. Kircher gives an account of a Sicilian, named the *fish Colas*, who, by a long habitude from his youth, had so accustomed himself to live in water, that his nature seemed to be quite altered, so that he lived rather after the manner of a fish than a man.

AMPHIBLESTROIDES, (from *αμφιβληστρον*, a *net*, aud *ειδος*, *form* or *shape)*; the retina, or net-like coat of the eye. It is a soft, white, and slimy substance, which is thus named, because, if thrown into water, it resembles a net. It shoots from the centre of the optic nerve, and consists of the medullary substance of it; and expanding itself over the vitreous humour, is extended as far as the ligamentum ciliare, or as far as the rays penetrate. If the whole eye was to be considered as

a flower growing to the brain by the optic nerve, this tunic would be the flower itself, and the other two, the sclerotica and choroides, be only in the nature of a calyx. This is the principal medium of sight, as it receives the impression of the rays that fall on the eye from surrounding objects, and transmits them to the sensorium. See RETINA.

AMPHISBÆ'NA, a genus of serpents, belonging to the order of *amphibia serpentes*, so called from the false notion of its having two heads, because it moves with either end foremost. The head of the amphisbæna is small, smooth, and blunt; the nostrils are very small; the eyes are minute and blackish; and the mouth is furnished with a great number of small teeth. The body is cylindrical, about a foot long, and divided into about 200 annular convex segments like those of a worm; and it has about 40 longitudinal streaks, of which 12 on each side are in the form of small crosses, like the roman X; the anus is a transverse slit; and the last ring or segment of the belly has eight small papillæ, forming a transverse line before the anus; the tail, i. e. all the space below the anus, is short, consisting of thirty annular segments, without being marked with the cross-lines, and is thick and blunt at the point. The colour of the whole animal is black, variegated with white; but the black prevails most on the back, and white on the belly. It has a great resemblance to a worm, living in the earth, and moving equally well with either end foremost. There are but two species, 1. The *fuliginosa*, which answers exactly to the above description, and is found in Libya and in different parts of America. 2. The *alba*, which is totally white, is a native of both the Indies, and is generally found in ant-hillocks. The bite of the amphisbæna is reckoned to be mortal by many authors; but as it is not furnished with dog-fangs, the usual instruments of conveying the poison of serpents, later writers esteem it not to be poisonous. They feed upon ants and earth-worms, but particularly the latter. Ætius says, the bite of this creature is like the sting of a bee, and that it may be cured in the same way; but prior writers describe it much more formidable.

AMPU'LLA, (αμϐολλα; from αναϐαλλω, to *swell out)*. All bellied vessels were so called in chemistry, as bolt-heads, receivers, cucurbits, &c.

AMPULLA, in anatomy, is applied by Scarpa, to the dilated portions of the membranaceous semi-circular canals, just within the vestibulum.

AMPUTATION, *(amputatio*, from *amputo*, to cut off); the cutting off a limb. Celsus is the first who describes this operation. Till the sixteenth century we have no account of any method to prevent a hæmorrhage, which happens in this sort of operation, except that of Celsus, of making a ligature about the vessels. Paré tells us, that, previous to making the incision, a ligature, with a thin fillet, must be made above where the amputation is to be performed, which, he says, first, keeps up the skin and muscles in a raised posture; secondly, prevents an hæmorrhage; and, thirdly, lessens the sense of feeling. He is the first who clearly speaks of preventing the hæmorrhage, when these operations are performed. In 1674, Mr. Morel, a French surgeon, introduced the tourniquet, as it is now used: but the first mention of this instrument is in the "*Currus Triumphalis è Terebintho*," published in London by Jacob Young, an English surgeon, in 1679. About the end of the sixteenth century, Messrs. Verduin and Sabourin, one a Dutchman, the other of Geneva, left a label of the flesh and skin to wrap over the stump, and called it, l'opération de *l'amputation à lambeau;* but they probably learned it from an Englishman, who published this practice in 1679. Paulus Ægineta used the actual cautery; but Ambrose Paré secured the vessels by drawing them a little out with the forceps, and making a ligature round them, as is often mentioned by Celsus, though neglected by so many of his successors. At present, improvements are both many and important in this branch of surgery; the crooked needle, and most other parts of the apparatus, &c. being now introduced or very greatly improved.

In amputation, the great end to be aimed at is, the procuring of a handsome, if not a useful, stump, in which the bone may not protrude, but be well covered with flesh; so that no excoriation or rawness may be apt to take place. As long ago as the year 1679, it was proposed by Jacob Young, to preserve a flap of flesh and skin, which was to be folded over the bone, and which, uniting to the parts of the wound after amputation, would effectually cover the bone, and prevent the inconveniences above mentioned. No traces of the success of this method, however, can be found till the year 1626; when a Latin dissertation was published upon it by P. Adrian Verduin, an eminent surgeon of Amsterdam. The most sanguine expectations were formed of its success; and it was even thought that the flap would prevent the necessity of tying up the blood-vessels. However, it does not appear that the method, as at that time practised, either did or could succeed: accordingly it was laid aside; but it has been since revived, with considerable improvements, by Mr. Alanson of Liverpool, whose method will be described hereafter.

Amputations may be rendered *necessary* when a member is so much diseased as to be useless, or when it puts life in danger.

The causes in general rendering this operation necessary are, bad compound fractures; extensive lacerated and contused wounds; part of the limb carried off by a cannon ball or otherwise, the

bones being unequally broken and not properly covered; extensive mortification; white swellings of the joints; large exostoses; ulcers attended with extensive caries; cancer or other incurable ulcers; various kinds of tumors; and particular distortions of the bones.

Amputations may also be sometimes necessary from violent hæmorrhage of some principal artery during the cure of a fractured limb, or from such a profuse discharge of matter taking place that the strength of the patient is exhausted. Lacerated and contused wounds may require amputation, on account of hæmorrhage ensuing which cannot be stopped. Extensive mortification may take place, and such large quantities of matter be formed, that the patient will not be able to bear up under the discharge.

Where part of the limb is carried off, it is necessary to amputate higher up, so as to cut the bone, as well as the soft parts, in such a manner as may admit of a much speedier and safer cure. When mortification occurs, every thing ought to be done for the support of the patient till the disease be stopped; the first sign of which is, the appearance of an inflamed circle between the diseased and sound parts. As soon as the diseased begin to separate from the sound parts, amputation of the limb ought to be performed, and no time ought to be lost, lest the patient suffer from the absorption of putrescent matter.

On this important subject, Mr. Pott observes, that in the instances generally demanding amputation, if the rule is adhered to, a limb will now and then be taken off that might possibly have been restored; but the number of those who would be so lucky is so small, in proportion to those who, under the same apparent circumstances, would end fatally, that it can make no difference in the general treatment. Selection of one case from another is what constitutes judgment in surgery; and happy is the man, who, amidst the frequent demands for amputation, singles out a case in which he can succeed, and saves the threatened limb.

No part of surgery is brought to greater perfection than the manner of performing amputation. Before the invention of the tourniquet, and the method of securing the vessels by ligature, the operation was seldom undertaken; and a great proportion of those upon whom it was performed died soon after. In the present improved method, one death does not happen in twenty, or even thirty cases. In performing the operation, particular attention is to be paid to the spot where the incision is to be made; the quantity of skin and cellular substance necessary to be saved, so as to cover the muscles and bone completely, without being stretched; cutting the muscles in such a manner that they may unite with each other and entirely cover the end of the bone; the prevention of hæmorrhages during the operation; the tying of the arteries alone, without including the nerves, or any of the contiguous parts; securing the integuments so as to prevent them from retracting after the operation; and a proper subsequent treatment of the case.

The following are the *general steps of the operation:* The patient being properly placed, with assistants to attend, and the apparatus in proper order, the flow of the blood to the limb is to be stopped by the *tourniquet.* The first incision is to be made through the skin and cellular substance by one, or rather by two, strokes of the amputating knife. These are next to be separated from the muscles, as far as may appear sufficient for covering the stump. The separated skin or flap should be strongly drawn up, or what perhaps answers better, turned up all round the limb, leaving this part of the muscles quite bare. The flap is to be kept in this situation by an assistant, while the operator makes the next incision at the edge of the reflected skin, and cuts till he comes to the bone. This incision should be begun on the lower side of the limb, that the blood may not prevent the eye from readily following the edge of the knife during the whole cut. The muscles are not to be separated from the bone, as high as may enable them afterwards completely to cover it. The soft parts in general are then to be drawn up by *retractors*, which may be either of leather or metal. The periosteum is to be divided at the place where the saw is to be applied; but no part of the bone is to be denuded of this membrane, which is afterwards to cover the stump, otherwise troublesome exfoliations may ensue. At this place the saw is to be applied, and the bone divided with long steady strokes. In this part of the operation a good deal depends upon the readiness of the assistant who holds the limb; for, if it be held too high, the motion of the saw will be impeded; while the bone may be splintered if it be not sufficiently raised. Any points or splinters which may be left, should be immediately removed with the *pincers.* The retractors are now to be laid aside, and the principal arteries separated from the nerves, and secured by the *tenaculum*, or forceps and ligatures. See INSTRUMENTS.

The tourniquet should next be a little slackened, to allow the different branches to be discovered; the clotted blood is to be cleared away with a warm spunge. The patient should have some warm cordial drink, and all the arterial branches which can be discovered ought to be taken up. The ends of the ligatures are then to be cut of such a length as to allow them to hang without the lips of the wound. The muscles and skin are now to be drawn down, and brought into close contact, that the stump may be completely covered. The parts

are next to be secured by proper bandaging; and, if the operation has been properly performed, the cure will commonly be made by the first intention, and may be completed in the course of three or four weeks, and sometimes in a shorter period. This, however, must depend much upon the constitution of the patient, as well as the manner of performing the operation.

1. *Amputation of the* ARM.—Amputation of the arm is performed according to the rules already laid down. No more of it should be removed than is diseased; for the longer the stump is, the more useful it proves. The tourniquet is to be applied a little above the part where the operation is to be performed: as much of the integuments should be saved as may be perfectly sufficient for covering the sore. In taking up the artery, after the bone has been divided, the operator ought to be attentive not to include the radial nerve, which may be readily discovered and separated, as it lies close upon the fore-part of the artery. The fore-arm is to be amputated nearly in the same manner as the leg; only that the stump may be covered by amputating with the double incision, without the assistance of a flap, which it is necessary to form in the leg.

In the Medical and Physical Journal, there appears the following account of an uncommon occurrence after amputation of the arm, by Mr. Rowlands, of Chester. We repeat it, in the hope that it may suggest some useful reflexions.

"On September the 9th, 1794, Robert Jones, a collier, was drawn up with great velocity out of a pit, forty yards deep, by the fore-arm, which was nearly separated from the elbow, by being drawn between the rope and the wheel. The accident happened early in the morning; and a surgeon in the neighbourhood applied a tourniquet about four inches below the shoulder. He was brought to the infirmary about six in the evening, and his arm immediately amputated above the ligature, which had been tight on all day. The man bore a journey of ten miles in a cart, with his arm in that shattered condition, and sustained the operation without either fainting or complaining; he took an opiate, and had a better night than could have been expected.

"The next day a clyster was administered, and he took saline draughts, with fifteen drops of vin. ant. in each, to remove a slight degree of fever: he continued the opiate every night. On the 13th, I looked at the stump," says Mr. Rowlands, "and had the satisfaction to find it perfectly united in every part, but where the single ligature hung out, only one artery having appeared. On the 22d the ligature separated; and, on the 25th, all dressings, except a little lint and the roller, were left off.

"The man had walked about the ward for many days, his appetite being good, and his nights undisturbed.—On the 27th, about three in the morning, I was desired to come to him immediately, the messenger at the same time informing me that he was bleeding to death. I hastened to him, and found the poor man in a miserable condition. The tourniquet had been applied by Mr. Manning, the house-apothecary; but, as the hæmorrhage came on in the middle of the night, he had lost so much blood before a discovery was made, that the bed was wet through, and it even flowed across the ward. After removing the bloody things from about the stump, I discovered the cause of this extraordinary accident, to be an extensive mortification of the artery and integuments covering it. The union of the stump continued complete; the skin having separated in a slough, about an inch from the edge of the cicatrix. I made a ligature on the artery, and dossils of lint were applied to the mouth of it. The wound was dressed with mild digestive; every means had been used, and were still continued, to recover him from the low, fainting state to which he was reduced; and a person was directed to watch him constantly, and to make a slight compression on the end of the vessel. 28th, No appearance of blood. 29th, In the night, a second sloughing of the artery took place, and the ligature came off. The tourniquet was tightened as expeditiously as possible; but so great was the loss of blood, that, in his reduced state, it had nearly destroyed him. As soon as he was a little recovered, I made an incision in the direction of the artery to the axilla, and put a ligature on the vessel, as high up as possible. The wound was dressed as before, and moderate pressure was continued by a careful assistant. Nothing further occurred worthy of observation; the wound healed slowly, but eventually so as to leave a very good stump; and he was discharged from the infirmary in good health on the 28th of November following."

2. *Amputation of the* THIGH.—In performing this amputation, the patient ought to be placed upon a table of ordinary height; with the diseased limb supported and secured by an assistant seated before him, while other assistants take care of the other leg and the arms. The course of the blood is to be stopped by applying the tourniquet over the trunk of the femoral artery, near the upper part of the thigh. No more of the thigh ought to be removed than is rendered necessary by the disease, as the more of it is left, the more useful it will be to the patient. An assistant should grasp the limb with both hands a little above the place where the skin is to be divided, and draw it up as far as possible; while the operator, standing on the outside of the limb, makes a circular incision down to the muscles, by one or two strokes of the

knife. As much of the integuments is then to be dissected with a scalpel from the muscles as may cover the stump completely; and this part of the skin may either be turned back, or drawn tightly up by an assistant. The muscles may then be divided quite across to the bone by the edge of the skin, in the common way, or cut obliquely upwards, according to the method of Allanson, so as to lay the bone bare two or three fingers breadth higher than is done in the common way. The muscles are next to be separated from the bone with a scalpel a little way, that a sufficient quantity may be left for covering the end of it. The rest of the operation is to be performed exactly according to the general rules laid down in the first section. The muscles and integuments are to be drawn over the end of the bone, and applied closely together, that the skin may completely cover the stump, and retained in this situation by an assistant till a flannel or cotton roller, according to the season of the year, which has been previously put round the body, be applied in such a manner as to support and fix them. For this purpose it should be passed two or three times, in a circular direction, round the top of the thigh, and should afterwards, with spiral turns, be brought down near to the end of the stump, and fastened with pins; and it should not be tighter than may be sufficient to assist the plasters in preventing retraction.

The ends of the divided muscles are now to be laid exactly over the bone; and the edges of the skin are to be brought into contact, either so as to form a straight longitudinal line, according to the method of Mr. B. Bell, &c.; or they are to be placed horizontally, "that the wound may appear only in a line with the angles at each side," as advised by Allanson. The ligatures may either hang over the edges of the wound, or be brought to the angles. After the edges of the skin are in this manner exactly applied to each other, either a few slips of adhesive plaster are to be laid across the face of the stump, or two large pieces of adhesive plaster, with several pieces of tape fixed to them, are to be applied to the surface of the skin. The tapes are then to be tied with a running knot immediately over the wound; by which the parts will be kept so closely together as to prevent any collection of matter from being formed. The whole surface of the stump should next be covered with a large pledget spread with an emollient ointment, over which a compress of fine tow is to be put, and retained in its place by a broad cross strap of old linen, passing some way up the thigh, so as to be secured by the roller, which is now to be passed two or three times round the stump; and the pressure formed by the cross strap may afterwards be increased or diminished at pleasure, by drawing it with more or less tightness, and fixing it with pins to the roller. While the stump is dressing, the tourniquet is removed, but replaced again loosely, to enable the attendants to check any hæmorrhage which may afterwards ensue.

The patient is now to be laid to rest, and the limb is to be placed upon a little tow covered with linen, or upon a thin soft pillow; and, to prevent the patient from involuntarily moving the limb, and to guard against spasmodic startings, which frequently happen after this operation, it may be fixed to the bed by two straps. A basket or hooped frame ought to be placed over the stump, to protect it from the bed-clothes. The patient should immediately have an anodyne draught, which will generally procure ease through the rest of the day. For this purpose, no more light should be let into the room than is merely necessary for allowing the attendants to pay attention to the stump. As hæmorrhages sometimes occur several hours after the operation, the person who takes the charge of the patient should watch this circumstance with the greatest attention. If there be only a slight oozing of blood, there is no occasion for being alarmed; but, whenever it appears to proceed from a large artery, it must be secured. The spasmodic affections which frequently occur after amputation are seldom troublesome, unless some nerve has been included in securing the arteries; but, when they do appear, laying the limb in the easiest posture, and giving opiates, are the principal means of procuring relief.

To prevent inflammation as much as possible, the patient is to be kept upon a strict antiphlogistic regimen, and his bowels kept open by laxative clysters, till the inflammatory stage is over, which will generally be in a few days. If, notwithstanding this treatment, the stump swells, and the patient complains of pain and tightness, we ought to endeavour to discover from what cause the uneasiness originates. If it be owing to the straps being too tightly fixed, they must be slackened. If the stump be found much swelled, a cooling solution should be applied by means of several folds of linen; and, if the patient be young and plethoric, he ought to lose a few ounces of blood from the arm; but, if he be weak and emaciated, a different mode of treatment must be followed.

At the end of the third, or fourth day at farthest, the stump should be examined; and, if it appears somewhat open and flaccid, the parts must be brought closer together and secured more firmly. After this time the dressing should be renewed every day, or every second day. In about a week after the operation, the ligatures may generally be removed with ease; but, if they do not separate readily, they may be gently pulled at every dressing, when they will, in a short time, be brought away, and the wound will be soon healed by the first intention. The roller should be cleaned and

renewed as often as it is found sullied; nor should it be laid entirely aside till the end of the third or fourth week after the operation. When the roller is removed, we must depend upon the straps or tapes for keeping the parts together till the cure be quite accomplished. When the inflammatory symptoms are entirely gone, no medicines ought to be given, which would debilitate the patient, nor is any thing more necessary than to keep the bowels open till a complete cure be made.

3. *Amputation of the* LEG, *&c.*—The leg is usually amputated, for a disease in the foot, at two different parts; the one a hand-breadth under the knee, the other a little above the ankle. The former makes a sufficient support for the body to rest upon an artificial leg; but the latter does that equally well, and likewise preserves the motion of the knee.

In performing the operation a little way *below the knee*, the patient is to be placed and secured in the same manner as in operating upon the thigh. The tourniquet is to be placed a little above the knee, with the cushion upon the artery in the ham. The surgeon places himself upon the inside of the leg, and makes a circular incision through the integuments down to the muscles. The place where the incision should be made must depend upon the length of the limb; but, in general, it may be between six and seven inches under the top of the tibia in an adult, or far enough down upon the same limb to save as much integuments as will cover the stump. After the integuments are cut through, in the manner already directed, as much of the muscles are to be divided by the knife as can be done by a circular incision; and the interosseous parts are to be divided by a scalpel or catline. The retractors are then to be applied, and the bone sawed off immediately below the insertion of the tendons of the flexor muscles. In sawing, the operator ought to begin upon both bones at the same time, that he may finish upon the tibia, lest splinters should be formed. The vessels are next to be secured; the soft parts drawn over the bones; the adhesive plasters and other bandages applied in the same manner as directed for amputating the thigh, only that here the roller need not be applied so high as in the former operation. Two or three turns above the knee, however, are necessary to prevent the dressings from slipping down.

In amputating at *the ankle*, the operation is performed in the same manner as that a little below the knee; but the operator should fix upon that spot which will leave the stump of such a length as may be most convenient for being fitted with an artificial machine resembling the other leg. Nine inches from the joint of the knee, in a leg of ordinary length, was found by Mr. Wilson, a late ingenious artificial limb-maker in Edinburgh, to be the best part suited to that purpose, on account of the equal pressure it makes upon the surface of the leg, without making any upon the end of the tender stump.

A patent has lately been obtained by a Mr. Potts, for a contrivance, which supplies a useful leg in cases of amputation above the knee.

The patentee, whose attention was drawn to the subject by the loss of his own leg, has constructed an artificial one, which he himself has worn for years, and which is possessed of the following advantages: "The knee and ankle joints," he asserts, "are entirely at the command of the wearer; and the appearance of their motions is so natural, as very nearly to conceal the loss of the extremity: the leg is made of light materials, and indeed of such as imitate both the bony and fleshy parts. It is worn with ease and perfect safety; it does not injure the dress, which other artificial legs are observed to do. The wearer can kneel and rise up; can sit down and rise up; can pull on a boot, and permit it to be drawn off by a boot-jack; he can turn the anterior part of the foot outwards and inwards; ride on horseback with perfect safety; and imitate almost every natural motion without any assistance of his hands."

4. *Amputation at the joints of the upper extremities.*—The circumstances most to be attended to in performing amputation at the joints of the extremities are, first, to stop the circulation by the tourniquet; or, where that is impracticable, to take up the trunk of the artery by a ligature; to make a circular incision in such a place as may, after the operation is over, be sufficient to cover the wound: then a longitudinal incision is to be made upon the opposite sides of the limb, extending from the joint to the circular cut, and as deep as the bone, by which two flaps will be formed to cover that part of the joint which remains after the operation is finished. The ligaments of the joint are next to be divided, and the affected limb, or part of the limb, removed.

After this part of the operation, it was formerly a frequent practice to scrape off the remaining cartilage, to unite the parts more firmly together. But this is now found to be unnecessary; for when the flesh is applied properly to the bone, if it do not grow to it, the union at least is so close that it afterwards gives no inconvenience to the patient.

Any branches of arteries which may have been cut during the operation, are now to be secured; clotted blood is to be removed; and the muscles and the skin are to be brought into close contact with the ends of the ligatures hanging out of the wound. The parts are to be retained by adhesive plasters, or twisted suture, or both; and proper bandages applied, in such a way, that a cure may be made by the first intention.

(1.) Amputating the arm at the *shoulder-joint* has always been considered as a dangerous as well as a difficult operation. It should never be attempted, when the same purposes can be accomplished by operating lower down. But cases occasionally occur, where the life of the patient cannot, in any other manner, be saved.

Amputation may become necessary here in consequence of abscesses of the joint; caries of the humerus reaching to the joint; compound fractures, especially those from gun-shot wounds, extending to the head of the bone; and of mortification.

In performing the operation, the patient should be laid upon a table of convenient height, covered with a mattrass. He is then to be brought as near to the edge of it as possible, and secured by assistants. The circulation of the blood in the arm is next to be stopped, by an assistant pressing strongly with a firm compress upon the subclavian artery where it passes over the first rib; or an incision may be made along the course of the artery, which may be secured after separating from it the contiguous nerves. When the artery is compressed, it will readily be known whether the compression proves effectual, by observing when the pulse at the wrist is entirely stopped. As soon as this is the case, a circular incision is to be made through the integuments, at the insertion of the deltoid muscle, into the humerus. An assistant then draws the skin a little back, and, at the edge of the retracted skin, the muscles are to be cut in a circular direction to the bone.

If the artery has not been taken up at the beginning of the operation, it is now to be secured, as well as any branches which come in the way.

The amputation-knife is now to be laid aside, and the rest of the operation finished with a strong scalpel. A perpendicular incision is next to be made at a little distance from the outside of the artery, beginning at the acromion, and terminating in the circular incision, cutting as deep as the surface of the bone. A similar incision is to be made on the back part of the arm, so that the flaps may be of an equal breadth. The arterial branches are here to be secured; the flaps are to be separated from the bone, guarding against wounding the trunk of the artery; the flaps are to be supported by an assistant, and the capsular ligament of the joint is to be cut from the scapula; and thus the arm will be entirely separated.

After the arm has been separated, any arteries which appear about the joint are to be tied, and all the ligatures brought over the edges of the wound. The parts are to be cleared of clotted blood, and the two flaps drawn over the wound, and secured by adhesive plasters. A pledget of soft ointment should then be applied, and a sufficient cushion of lint, with a compress of old linen, put over the whole. A moderate pressure is next to be applied by a flannel roller; by which the parts will be supported, their union facilitated, and matter, most likely, prevented from being lodged. The treatment is then the same with that after amputation in other parts of the extremities. For two or three days after the operation, it is necessary that an assistant sit with the patient, to compress the artery, in case a bleeding should ensue.

(2.) When it is necessary to amputate *the whole hand*, the operation may be performed at the wrist, so as to leave as much of the member as possible; and the same rules hold here as in amputating at any of the rest of the joints. The tourniquet is to be applied to the artery in the arm, and the cure is to be completed by the first intention. When any of the carpal bones are affected, the sore will not heal till these either work out by suppuration, or are cut out by the knife. When the middle of any of the metacarpal bones is diseased, while their extremities are sound, the trepan may be applied, and the diseased parts removed, while the remaining sound parts are preserved. But, if the whole bodies of one or two of these bones be affected, while the rest remain sound, all the affected bones ought to be removed. In performing the operation, an incision is to be made along the course of the part affected; and, if the operator have it in his choice, the incision should be made upon the back part, so as to save the great vessels and nerves situated in the palm. The integuments are then to be dissected, and turned to each side; after which the diseased bones, or parts of bones, are to be removed, guarding as much as possible against wounding the principal arteries or nerves which lie near them.

The diseased parts are next to be separated; any arteries which happen to be cut are to be secured; and, on account of the free communication which they have with neighbouring branches, they ought to be tied at both cut ends. If, after this, a bleeding still continues, compress, stypties, and other remedies proper for stopping blood, are immediately to be used. The sides of the wound are to be brought together, and an attempt made to cure them by the first intention.

(3.) In *amputating the fingers*, it was formerly the practice to operate upon the bodies of the bones in the same manner as in the larger extremities; but at present the removal at the joints is more frequently practised.

In performing the operation, it is necessary to save as much skin as may cover the stump, and this ought to be done upon the side next the palm, so as to guard against the effects of friction. The general steps of the operation are the same with those for amputation of the larger joints.

A circular incision is to be made on the finger

by a crooked bistoury, about the middle of the phalanx, and it may be carried at once to the bone. Another incision is to be made with a common scalpel at each side of the finger, beginning at the circular one, and continuing it to the joint, by which two flaps will be left to cover the stump. The ligaments of the joint are now to be divided, and the bone removed. The blood-vessels are to be secured by ligature, and the flaps exactly applied to each other; but in order to protect the end of the bone completely, a small portion may be cut from the uppermost flap. The flaps are to be retained by adhesive plaster, or by the twisted suture; but if the latter be used, the tendons ought to be avoided. Over the sore an emollient pledget is to be applied, and then a compress and roller. If the disease be so situated, that instead of amputating at the cavity of the joint, the surgeon shall think proper to operate upon the body of the bone, flaps are to be formed as above, and the bone is to be divided by means of a small spring saw.

5. *Amputation at the* HIP *joint*.—The amputation of the thigh, at *the hip joint*, has always been considered as one of the most formidable operations in surgery; so much so, that very few cases appear on record of its having ever been put in practice. In the Medical Commentaries of Edinburgh, an instance is recorded where the thigh was amputated at this joint, and where the patient survived the operation eighteen days, and then died from a different cause, when all risk of hemorrhage was over, and when the sore had even a favourable appearance; which shews at least that the operation may be done with safety. It certainly ought never to be done, however, unless as the last resource, and when the life of the patient is in absolute danger, and then only when as much skin and muscles can be saved as will cover the sore, and when there is also a probability of being able to stop the hemorrhage, and prevent it from returning.

When the operation is to be performed, the patient is to be laid upon his back on a table, and properly secured by assistants; one of whom should be ready with a firm cushion to press, if necessary, upon the top of the femoral artery just after it passes from behind Poupart's ligament to the thigh. A longitudinal incision is now to be made through the skin, beginning immediately under the ligament, and continuing it downwards along the course of the artery for about six or seven inches. The aponeurosis of the thigh is then to be divided by gentle scratches till a furrowed probe can be introduced, when the opening is to be dilated by means of a scapel, till two or three inches of the artery be laid bare. A strong ligature is now to be put under the artery by the assistance of a curved blunt-pointed needle.

The part where the ligature should be passed is immediately above the origin of the arteria profunda; for if that artery be not affected by the ligature, the patient might suffer by the loss of blood during the rest of the operation. The ligature is now to be secured by a running knot: another ligature is to be introduced a little below the former, and likewise secured; the artery is then to be divided between the ligatures. A circular incision is now to be made through the integuments of the thigh, about six inches from its upper end. The retracted skin is then to be pulled at least an inch upwards; and at the edges of it the amputating knife is to be applied, so as to cut the muscles down to the bone. This being done, a cut is to be made upon the posterior part of the thigh, beginning a little higher than the great trochanter; and continuing it down to the circular incision, and as deep as the joint. A similar cut is to be made on the anterior part of the thigh, at a small distance from the artery, and this reaching likewise down to the bone. The two muscular flaps are to be separated from the bone and joint, and held back by an assistant. Every artery which appears is now to be secured. Then the capsular ligament, and next the round one, are to be separated from the acetabulum; by which means the limb will be removed from the body. The acetabulum and neighbouring bone are next to be examined; and if they appear sound, the case will be more favourable; but, at any rate, a cure is to be attempted by the first intention. For that purpose, after removing all the clotted blood from the surface of the wound, and bringing the ligatures over the edges of the skin, the muscles are to be placed as nearly as possible in their natural situation; and drawing the flaps together, so as to cover the wound in the most accurate manner, they are to be kept in this situation by adhesive plaster, and by the twisted suture and other dressings, as in amputating at the under part of the thigh. The dressings are to be retained by a broad flannel roller passed three or four times round the body, and spirally over the stump, and secured. The patient is then to be laid in bed on the sound side, and treated as for amputation in other parts of the body; only that a greater attention is necessary, as there is no assistance from a tourniquet. Uncommon attention will also be necessary to prevent inflammation, and every symptom of fever which may succeed to the operation.

6. *Amputation of the* FOOT, *&c.*—When *the foot* is so much diseased as to require amputation, the operation might be performed at the point of the ankle; but, for the reasons given when treating of amputation of the leg, it is found better to do it above the ankle. When a considerable part remains sound, it ought to be saved. If any of the tarsal bones are affected, these are to be removed. When the middle or whole body of any of the me-

tatarsal bones are diseased, they are to be removed in the same manner as directed for similiar operations in bones of the hand; and if even two of them remain sound, provided they be so placed as to support the toes, they ought to be preserved, as it is known that, by proper treatment, an osseous matter may afterwards fill a considerable part, if not the whole, of the void; or, if any cavity remain, it may be so filled that the use of the foot may still be enjoyed.

In performing an operation of this kind, the patient should be laid upon a table, and the tourniquet applied to the ham to prevent hemorrhage. An incision is then to be made along the affected part; and if the seat of the disease admit it, the incision should be made upon the upper side of the foot, so as to save the sole. The integuments are to be separated and turned to each side, to allow the affected parts to be completely removed.

The principal vessel and nerves are to be saved as much as possible; but if any particular artery be cut, it is to be secured, and the part treated as after the removal of similar parts of the hand.

The amputation of *the toes* is exactly similar to that of the fingers.

7. *Extirpation of* CARIOUS JOINTS.—In compound fractures, the ends of bones, when protruding in such a manner that they could not otherwise be returned, have frequently been sawed through and removed; and their place has sometimes been supplied by a renewal of bone, so as to preserve the ordinary use of the limb. Many cases have likewise happened, where a large part of the body of the bone has been thrown out by exfoliation, and its place supplied; and a few are upon record where either the whole of a bone, or that end next the joint, has been thrown out, and its place filled up with callus, so that no inconvenience has been felt. From these circumstances, Mr. White of Manchester was led to preserve an arm, by sawing off the head of a diseased humerus; and Mr. Park of Liverpool, to save a limb, by sawing off the ends of the bones, in a case of white swelling of the knee. When, therefore, it happens that the end of a bone is diseased, while the other parts are sound, the diseased part may be removed, and the sound one saved, so as in a great measure to preserve the free use of the limb.

In performing the operation, the first step should be, to use such means as may enable the operator to have a full management of the circulation in the part affected. Then a longitudinal incision of sufficient length, and perhaps another across it, may be necessary to be made through the soft parts of the joint; and this opening ought to be at a distance from the large blood-vessels, that they may be in no danger of being injured. After the end of the diseased bone is sufficiently laid bare, it is either to be brought out of the joint, or a spatula or some other proper substance is to be introduced between the bone and soft parts, so as to defend the latter in time of sawing the bone. After the diseased part of the bone is removed, the arterial branches are to be secured, and the wound treated like any other wound of equal size.

Perhaps it may be more satisfactary to the reader to have an account of this operation in Mr. Park's own words. In a case which he describes, he says:

"An incision was made, beginning about two inches above the upper end of the patella, and continued about as far below its under extremity: another, crossing this at right angles, immediately above the patella, the leg being in an extended state, was made through the tendons of the extensor muscles down to the bone, and nearly half round the limb; and the lower angles formed by these incisions were raised so as to lay bare the capsular ligament: the patella was then taken out, and the upper angles were raised, so as fairly to denude the head of the femur, and to enable me to pass a small catline across the posterior flat part of the bone immediately above the condyles, taking care to keep one of the flat sides of the point of the instrument quite close to the bone all the way. The catline being withdrawn, an elastic spatula was introduced in its place, to guard the soft parts while the femur was sawing through. Which done, the head of the bone, thus separated, was carefully dissected out: the head of the tibia was then with ease turned out and sawn off, and as much as possible of the capsular ligament dissected away, leaving only the posterior part covering the vessels; which, on examining, I had the satisfaction to find had not only escaped unhurt, but that it was not a very narrow escape: they had still a pretty good covering, and had been, through the whole operation, far enough out of the course of the knife. It must be confessed, that the appearance of the wound was somewhat formidable, exhibiting a very large cavern with very thin parietes; and in short, there seemed little wanting to complete the amputation: yet as the limb below would not be deprived of any part of its nourishment, and as every healthy incised surface, as well of bone as of soft parts, has a natural tendency to granulate, I could not see any room to doubt, that nature would be able to repair the breach."

This gentleman afterwards informs us, that he attempted to perform the operation without making the tranverse incision: but he found it could not be done; and after spending some time in the attempt, it was thought advisable to desist from it. More than two inches of the femur, and rather more than one inch of the tibia, were removed; which were but just enough to admit of the leg being brought into a right line with the thigh, the previous contraction of the flexor muscles being such as to keep the two sawn ends of bone in close

contact; this produced a considerable redundance of the teguments. To support this, that it might not fall inward, and to keep the edges of the incision in apposition till they should acquire some degree of firmness, a few stitches were passed through the skin; not merely along the course of the transverse incision, but upon that part of the longitudinal cut that extended up the thigh. The lightest superficial dressings only were applied, and the limb placed in a case of tin from the ankle to the insertion of the glutæus muscle.

To this operation objections are very candidly enumerated; but Mr. Park thinks all of them may be obviated. There are two, however, which, Mr. Bell thinks, will always appear against it: the first is, that where the bones of large joints are so much diseased as to render it necessary to remove them, the surrounding soft parts are commonly so much thickened, inflamed or ulcerated, as to render any attempt to save them very uncertain, and much more hazardous than the amputation of the limb: and the second is, the high degree of inflammation that commonly succeeds to wounds of the larger joints.

As to the first of these, Mr. Park says he wishes it to be understood, that it is chiefly in affections of the joints produced by *external violence*, that he thinks this operation will be peculiarly useful; and with respect to the last, he observes, that the heads of large bones have been frequently sawn off, without any violent symptom taking place: and as he supposes this to be owing to the very free division of the capsular ligaments, which in such cases must always happen, he thinks that the total removal of this ligament, which he advises in this operation, will in a great measure prevent it. Experience alone can determine upon the merits of this operation; but Mr. Bell cannot avoid remarking, that no necessity appears for the removal of any part of the capsular ligament. It may be highly proper to make the opening into it free and large; but to remove it, by dissecting it off from the contiguous parts, must probably add to the risk of the operation, by rendering the inflammation more severe than it otherwise might be; at the same time that it must necessarily render it much more painful as well as more tedious.

During the cure, the limb ought to be kept in the posture most favourable for the removal of the bone, and afterwards for the preservation of the natural motion of the joint.

On the whole of the case we cannot help hoping, with the ingenious proposer of this operation, that, in this way, a limb may sometimes be saved which would otherwise have been removed. Yet though the removal of the diseased end of one bone may be readily effected, the removal of all that part of the bones which enters into the composition of a joint must be attended with so much inconvenience, that it can seldom be done, unless it be where the ends of bones are destroyed by external violence; for then it appears that this operation may be performed with a reasonable prospect of success.

8. *Amputation of the* BREAST.—In this case women only are the subjects.

The patient being placed on a high chair, hold her arm horizontally backward, and a very little downward; thus the pectoral muscle is more readily expanded, and the disordered part more easily separated from it; then make a circular incision through the teguments, and dissect the morbid part out. This done, if strength admits, take away blood. The compress and bandage are generally sufficient to prevent hæmorrhage, the needle being seldom required; yet sometimes the branches of the mammary arteries, which come out between the cartilages of the ribs into the breasts, will create some trouble, especially one larger than the rest from towards the arm-pit, near the edge of the pectoral muscle, which is commonly more troublesome to take up than the rest. We may then proceed as in wounds in general.

If, in the course of the cure, a fever comes on, with pains about the præcordia, and a difficulty of breathing, death is the consequence. We should be careful, by proper and timely bleeding, to prevent these symptoms. See CANCER.

The instruments described in amputations are shewn under the article INSTRUMENTS.

AMYGDALÆ, (αμυγδαλον; from αμυσσω, to *lancitate;* so called because, after the green husk is removed from the fruit, there appear upon the shell certain fissures, as it were lacerations); almonds. The kernels of the fruit of the almond-tree, *amygdalus communis* Linn.; *Amygdalus foliis serraturis infinis glandulosis, floribus sessilibus geminis.* Class, *Icosandria.* Order, *Monogynia.* Gen. Plant. 619.

The leaves and flowers of the almond-tree resemble those of the peach. It is a native of Africa, cultivated in the southern parts of Europe, and even in England, where it produces fruit very little inferior to that from abroad. It flowers earlier in the spring than most other trees, though its fruit is not quite ripe until autumn.

We have two sorts of almonds, the *sweet* and the *bitter;* yet the eye distinguishes no difference betwixt the trees, nor between the kernels themselves. Travellers say, that, by altering the soil, the bitter brings forth sweet, and the sweet brings forth bitter almonds; but this account is, to say the least, suspicious. The almonds from Barbary, where the tree is indigenous, are bitter, while those cultivated in Europe are sweet. In fact, Linnæus describes the two trees as varieties.

1. The bitter almonds agree with the sweet in yielding the same quantity of oil, not to be dis-

tinguished from that of the sweet sort, and in all cases to be used for the same purposes; the matter remaining after the expression of the oil retains all the bitter, and tastes stronger than it did at first. Most of the bitter matter dissolves with a little heat in water and in spirit of wine, and a part arises with both in distilling; but spirit seems to extract the most, and water to elevate the greatest quantity. A simple water is distilled from them after the oil is pressed out, which possesses the same qualities, and in the same degree, as that drawn from cherry-stones. These afforded, formerly, the now exploded *aqua cerassorum nigrorum*, *black-cherry water*.

The distilled water of bitter almonds, being strongly impregnated with the noxious matter which gives them their bitterness and flavour, may prove a poison to man, as is the case with the common laurel, to which it appears extremely analogous. Yet these are commended by old writers, as being destructive of worms, in the dose of four or five, or more, taken in a morning fasting. They are somewhat diuretic, but not safe as a medicine.

Dr. Cullen says of the *amygdalæ amaræ*.—"These have been long known to be a poison with respect to many brute animals; and there are some instances alleged of their being such to men. We at present understand this, from observing that they contain the same peculiar bitter that is found in the lauro-cerasus, and in the other kernels mentioned above. It is alleged that they are not so powerful with respect to man as they are to other animals; and they have, in a certain quantity, been often admitted both in diet and medicine. Their medicinal qualities, however, are, as I have said before, not well ascertained; but there is one virtue, which is, their being a remedy in intermittent fevers: that is well established on the authority of the learned *Bergius*.

"His manner of administration is the following: He takes two drachms of kali tartarisatum, and an ounce and a half of honey. These he diffuses in a pound of water; and with this water he makes an emulsion with one ounce of bitter almonds, to be strained in the ordinary manner. Of this emulsion he gives, during the intermission, a pound or two every day, and says that, by this remedy, the recurrence of ague is prevented. He acknowleges, indeed, that certain fevers have resisted this remedy, and obliged him to have recourse to the bark; but even then, with the decoction of the bark, he mixes the bitter emulsion. And he says also, that he had seen intermittent fevers frequently recurring, and which had resisted the bark, at length entirely cured by the bitter emulsion alone." Dr. Cullen says, he has had so little opportunity of practising upon intermittent fevers, or upon any but those which readily yield to the bark, that he had never an opportunity to imitate the practice of *Bergius;* but, he says, if he were, he should certainly proceed with some caution in exhibiting such quantities of the bitter almond.

Some of the ancient physicians had an opinion, that bitter almonds, taken before drinking wine, would prevent ebriety: but *Bauhin*, from experiments made on purpose, denies this.

2. The *sweet* kind, of which those called *Jordan almonds* are the best, should be recently taken from the shells, and free from rancidity. Dr. Cullen describes them with other *nuces oleosæ*. They with difficulty digest in the stomach, and afford very little nourishment, unless extremely well comminuted by mastication. As medicine, they are supposed to obtund acrimony in the primæ viæ, being reckoned softening and relaxant. They are a good intermedium for uniting with water several substances, which of themselves are not miscible with it: camphor and some of the resinous substances, triturated with six times their quantity of almonds, easily dissolve into a milky liquor. Six or eight sweet almonds peeled sometimes cure the heart-burn.

Sweet almonds are usually blanched, i. e. freed from their skin, by steeping them in hot water until it easily slips off. Then triturated with water, their oil unites therewith, by the mutation of their mucilaginous and farinaceous matter, into an emulsion or milky liquor.

Emulsio Amygdalæ Communis. Edin.

Take of Sweet almonds, one pound;
Water, two pounds and a half.

Beat the blanched almonds in a stone mortar, gradually pouring on them the water; then strain.

Lac Amygdalæ. Lond. Dubl.

Take of Sweet almonds, an ounce and a half;
Double refined sugar, half an ounce;
Distilled water, two pints.

Beat the almonds with the sugar; then, rubbing them together, gradually add the water, and strain the liquor.

Emulsio Arabica. Edin.

The arabic emulsion is made in the same manner as the almond emulsion; only adding, whilst beating the almonds,
Mucilage of gum arabic, two ounces.

Emulsio Arabica. Dubl.

Take of Gum arabic, in powder, two drachms;
Almonds, blanched, half an ounce;
Double refined sugar, three drachms;
Decoction of barley, one pound.

Dissolve the gum in the warm decoction, and, when nearly cold, pour it upon the almonds, previously well beaten with the sugar, and at the same time triturate them together, so as to form a kind of milk, and then strain.

The pure oil of almonds, triturated with a thick mucilage of gum arabic, forms a more permanent emulsion, from which the oil does not separate after standing for two or three days. This is not the case with the foregoing compounds, in which there occurs a spontaneous separation of the oil, in the form of cream, rising to the surface; and the liquid beneath, after still longer keeping, turns sour.

The emulsions partake of the quality of the oil, and are prescribed in the same intentions, particularly in heat of urine and the strangury, whether arising from spontaneous acrimony, or from irritating food or medicines.

The expressed oil of almonds is obtained from the sweet or the bitter sorts equally; no difference can be discovered in their oils by any known method of trial: the oil of bitter almonds was called *metopium*, because the Egyptians used to make an oil in which bitter almonds and galbanum were ingredients: they named their compound oil metopium, from the plant so called, from which the galbanum is produced; and others give the same name to the simple expressed oil of this fruit.

By bruising, and then pressing, the almonds, they afford nearly one half of their weight in oil. On boiling almonds in water, part of their oil separates, and is collected on the surface; but that obtained by pressure, without heat, is the most agreeable, and least likely to become rancid.

This oil is useful externally, like that of olives and linseed, to soften and relax the parts to which it is applied; but it is in no respect superior to olive oil as a topical remedy, and is therefore seldom employed in preference to it. Internally, it is given to counteract acrimony, and give relief when a tickling cough, hoarseness, costiveness, or nephritic pains affect the patient. To infants, it is given as a laxative, but often proves binding, by diminishing the strength of their bowels. Oil of almonds may be given in the form of an emulsion, mixed with some aqueous menstruum, united by the yolk of an egg, or volatile alkali, in the proportion of one ounce and a half, or two ounces to half a pint of water, and sweetened with half an ounce of some agreeable syrup. Draughts of manna and oil of almonds, properly incorporated, together with the common almond emulsion, as drink, are of singular service in the gravel, and in dysuries. Women who have had hard labours experience benefit, it is said, by taking repeated doses of this oil for several days before the time of delivery: but the tenesmus, to which some pregnant women are subject, and which endangers abortion, is most speedily relieved by clysters of it, with a few drops of laudanum.

The *amygdalus nana* and *amygdalus perdica* (or common *plum*), have a place in foreign dispensatories.

AMYGDALÆ; a name for the tonsils or almonds of the ears. See Tonsils.

AMYGDALÆ AMARÆ; bitter almonds. See Amygdalæ.

AMYGDALUS COMMUNIS; the systematic name of the plant which affords both sweet and bitter almonds. See Amygdalæ.

AMYGDALÆ DULCES; sweet almonds. See Amygdalæ.

AMYGDALUS PERSICA; the systematic name of the common plum tree. See the article Persica.

AMYLUM, (from the Greek ἄμυλον; from α, priv. and μύλη, a *mill;* because it was formerly made from wheat without the assistance of a mill); the fecula of wheat, commonly called starch. This substance subsides from the water that is mixed with wheaten flour. The starch-makers suffer it to remain in the water for a time after it has become acid, which makes it very white and soft to the touch, and scarcely sensible to the taste. As starch forms the greatest part of flour, it cannot be doubted but that it is the principal alimentary substance contained in bread.

The process commonly employed for making starch is this: Put wheat into water, and let it ferment in the sun. Change the water twice a day, for eight or twelve days, in which time the grain easily bursts, and is then also sufficiently fermented. Now put it, by little and little, in a canvas bag, to separate the flour from the husk, by rubbing and beating on a plank, which is laid across the vessel appointed to receive the flour. As the vessels are filled, a reddish water will be seen swimming at the top, and this is to be skimmed off, clean water put in its place, and this also, after stirring, strained through a sieve. What stays behind must be put into fresh water, and exposed to the sun. As the sediment falls from the strained liquor, the water must be decanted off from that which settles. This is the starch, which must be dried in the sun. Scheele observes, that three ounces of wheat will yield eleven drachms of fine starch.

As a medicine, this article has its uses, in common with some of the mucilages, as a mild astringent. Mixed with milk, it is an excellent kind of aliment in fluxes and catarrhs; one or two drachms of starch, dissolved and boiled in three ounces of water, with a little sugar, forms an elegant jelly, of which a table spoonful may be taken every hour or two. Milk starch, with the addition of suet, finely shred, and incorporated by

boiling, is the soup employed by Sir John Pringle in dysenterics, where the mucous membrane of the intestines has been abraded. In the latter disease, the mucilage of starch is a vehicle well adapted for the exhibition of opium by the rectum.

Enema Opiatum. Pharm. Chir.

Take of the Mucilage of starch, half a pint;
Tincture of opium, one drachm.
Mix them.

The opiate, in this case, may be augmented according to circumstances. This is a desirable remedy, particularly in spasmodic affections of the neck of the bladder, and in that distressing sense of weight and uneasiness when the prostate gland is affected in a gonorrhœa.

As a constituent of many vegetable productions, it forms a most important alimentary substance. Starch is found, in many vegetables, combined with different substances. Fourcroy accordingly makes various species of it, as combined,

1. With gluten or fibrine, as in wheat, rye, and other similar seeds.
2. With extractive matter, as in beans, pease, lupins, &c.
3. With mucilage, as in the potatoe and many other roots, and in unripe corn.
4. With saccharine matter, in most roots, and in corn after it has begun to germinate.
5. With oil, in the emulsive seeds, almonds, &c.
6. With an acrid principle, as in the root of the burdock, jatropha manihot, arum, asarum, and other tuberous roots.

The officinal preparations are: *Mucilago Amyli*, Edin. Lond. *Trochisci gummosi*, Edin. Lond. *Pulv. trag. comp.* Lond. *Pil. hydrarg.* Edin.

AMY'RIS ELEMI'FERA, (*amyris*, from α, *intensive*, and μυρος, *ointment*, or *balm*; so called from its use or smell); the systematic name of the plant from which, it is supposed, we obtain the resin called gum elemi. See Elemi.

AMYRIS OPOBALSAMUM; the systematic name for the plant from which the balsam of Mecca is obtained. See Balsamum Gileadense.

ANACA'RDIUM OCCIDENTA'LE, αναχαρδιον; from ανα, *without*, and καρδια, *a heart*); because the pulp of the fruit, instead of having the seed inclosed, as is usually the case, has the nut growing out of the end of it. It is the cashew-nut, the oil of which is an active caustic, and employed as such in its native country. However, neither that, nor any part of the fruit, is used medicinally with us.

ANACARDIUM ORIENTALE; the anacardium, or Malaca-bean. The nut so called in the pharmacopœias is of a shining black colour, heart-shaped, compressed, and about the size of the thumb nail. It is obtained from the *avicennia tomentosa; foliis cordato-ovatis, subtus tomentosis* Linn. It is not used medicinally in this country.

ANACARTHA'RSIS, (ανακαθαρσις; from ανα, and καθαιρομαι, to *purge up*); an expectoration of pus from the lungs.

ANÆSTHE'SIA, (αναισθησια; from α, priv. and αισθανομαι, *to feel*); a loss of the sense of touch. It forms a genus of disease in the class *locales*, and order *dysæsthesiæ* of Cullen. This sense may be hurt by any thing that obstructs the nervous influence, or prevents its being regularly conveyed to the organs of touch, as pressure, extreme cold, &c. It may likewise be hurt by too great a degree of sensibility, when the nerve is not sufficiently covered by the cuticle or scarf-skin, or where there is too great a tension of it, or it is too delicate. Whatever disorders the functions of the brain and nerves, hurts the sense of touching. Hence it appears to proceed from the same general causes as palsy and apoplexy, and requires nearly the same method of treatment.

In a stupor, or defect of touching, which arises from obstruction of the cutaneous nerves, the patient must first be purged; afterwards, such medicines as excite the action of the nerves, or stimulate the system, may be used. For this purpose, the spirit of hartshorn, either by itself, or combined with essential oils, horse-radish, &c. may be taken inwardly; the disordered parts, at the same time, may be frequently rubbed with fresh nettles, or spirit of sal ammoniac, or with the camphorated or oily volatile liniments. Blisters and sinapisms applied to the parts will likewise be of use; and also warm bathing, especially in the Bath waters.

ANAGA'LLIS, (αναγαλλις; from αναγελαω, *to laugh*; because, by curing the spleen, it disposes persons to be chearful); the *anagallis arvensis; foliis indivisis, caule procumbente* Linn. It is small and delicately formed, and does not appear to possess any particular properties that entitle it to distinction as a medicine.

ANAGALLIS ARVENSIS, the systematic name for the *anagallis* of the shops. See Anagallis.

This plant is low and succulent, differing in its appearance from chickweed, by the spots underneath its leaves; in having no pedicles; in the seed-vessels opening not at the top, but horizontally; in the flowers not being white, but red or blue: it is annual, grows wild in corn fields and other cultivated ground, and flowers from May to August. The expressed juice, inspissated to an extract, possesses a pungent saline austerity; and has been reputed resolvent and detergent.

ANALE'PSIA, (from ανα, and λαμβανω, *to take again*). Johannes Anglicus calls that species of epilepsy thus, which proceeds from the stomach being disordered. So also does Riverius; and it

is by some put synonimously with epilepsy in general. See EPILEPSIA.

ANALE'PSIS, (from αναλαμβανω), *to recover* and *regain vigour after sickness.*

ANALEPTICS, (*analeptica*, αναληπτικα; from αναλαμβανω, to *recruit*, or *recover*); those substances, used for food and medicine, which are calculated, from their properties, to restore strength when impaired by sickness. Some also call *analeptics* such things as exhilarate the spirits, in which sense they rank with cardiacs and restoratives.

Dr. Cullen says, "they are medicines suited to restore the force of the body when lost, and sometimes employed with respect to stimulus; but more commonly with respect to those substances which supply a deficient nourishment." The term he considers as attended with ambiguity, and would not have it employed at all.

ANALOGY, a certain relation and agreement between two or more things, which in other respects are entirely different. There is likewise an analogy between beings that have some conformity or resemblance to one another; for example, between animals and plants; but the analogy is still stronger between animals of two different species; and it is this last which accords more immediately with medical and physical investigations.

Analogy enters into all our reasoning, and serves to explain and illustrate. A great part of our philosophy, indeed, has no other foundation. It is natural to mankind to judge of things less known, by some similitude, real or imaginary, between them and things more familiar or better known. And where the things compared have really a great similitude in their nature, when there is reason to think that they are subject to the same laws, there may be a considerable degree of probability in conclusions drawn from analogy. Thus we may observe a very great similitude between this earth which we inhabit, and the other planets, Saturn, Jupiter, Mars, Venus, and Mercury. They all revolve round the sun, as the earth does, although at different distances, and in different periods. They borrow all their light from the sun, as the earth does. Several of them are known to revolve round their axes like the earth, and, by that means, must have a like succession of day and night. Some of them have moons, that serve to give them light in the absence of the sun, as our moon does to us. They are all, in their motions, subject to the same law of gravitation, as the earth is. From all this similitude, it is not unreasonable to think, that those planets may, like our earth, be the habitation of various orders of living creatures. There is some probability in this conclusion from analogy. But it ought to be observed, that, as this kind of reasoning can afford only probable evidence at best, so, unless great caution be used, we are apt to be led into error by it. To give an instance of this: anatomists, in former ages, seldom dissected human bodies; but very often those of quadrupeds, whose internal structure was thought to approach nearest to that of the human body. Modern anatomists have discovered many mistakes which the ancients were led into, by their conceiving a greater similitude between the structure of men and of some beasts than there really is.

That analogical reasoning from a supposed similitude of mind to body, which appears to be the most fruitful source of error with regard to the operations of our minds, may be illustrated by the following instance: when a man is urged by contrary motives, those on one hand inciting him to do some action, those on the other to forbear it; he deliberates about it, and at last resolves to do it, or not to do it. The contrary motives are here compared to the weights in the opposite scales of a balance; and there is not perhaps any instance that can be named, of a more striking analogy between body and mind. Hence the phrases of weighing motives, of deliberating upon actions, are common to all languages. From this analogy, some philosophers draw very important conclusions. They say, that, as the balance cannot incline to one side more than the other, when the opposite weights are equal; so a man cannot possibly determine himself if the motives on both hands are equal; and as the balance must necessarily turn to that side which has most weight, so the man must necessarily be determined to that hand where the motive is strongest. And, on this foundation, some of the schoolmen maintained, that if a hungry ass were placed between two bundles of hay equally inviting, the beast must stand still and starve to death, being unable to turn to either, because there are equal motives to both. This is an instance of that analogical reasoning, which, it is conceived, ought never to be trusted; for the analogy between a balance and a man deliberating, though one of the strongest that can be found between matter and mind, is too weak to support any argument. A piece of dead inactive matter, and an active intelligent being, are things very unlike; and because the one would remain at rest in a certain case, it does not follow that the other would be inactive in a case somewhat similar. The argument is no better than this, that, because a dead animal moves only as it is pushed, and if pushed with equal force in contrary directions, must remain at rest; therefore the same thing must happen to a living animal; for surely the similitude between a dead animal and a living, is as great as that between a balance and a man.

According to Professor Castillon, of Berlin, the principal uses of analogy in the investigation of

physical and moral truth, may be reduced to these four: 1. By means of our senses to improve, first our own judgment, and afterwards that of others, with respect to intellectual subjects. 2. To deduce a general from a particular truth. Having discovered and proved the truth of a proposition with respect to any particular object, examine whether this truth flows from a quality peculiar to this single object, or common to several objects. In the latter case, all these objects may be comprehended under one general idea, founded on their common quality. Substitute this general idea instead of the particular object, and the proposition will become general, without ceasing to be true; because whatever evidently and solely results from the identity, on which an analogy is founded, must necessarily be true with respect to all those objects in which the analogy is the same. 3. To prove the truth or falsehood of propositions which cannot be otherwise demonstrated. 4. To discover new truths in both natural and moral philosophy.

It must be more particularly observed, however, that, as analogy is frequently instrumental to the success of anatomical and physiological investigations; so, on the other hand, a reliance on it too implicitly is very liable to lead us into serious errors. Numberless instances of this fact might be adduced, and these should have the effect of tempering the ardour of some, who, in their pursuit after that knowledge which is difficult of attainment, suffer themselves to be too sanguine in their conclusions. See COMPARATIVE ANATOMY.

ANALOGISM, (αναλογισμος), is the judging of diseases by similar appearances, or discovering a thing unknown, by its similitude with something already known; and this way of induction was called by the ancient writers, *medicina rationalis prædogmatica*, in opposition to the *empirica*, which was conducted by appearances only, without any theory.

ANA'LYSIS, (αναλυσις, from αναλυω, *to resolve)*; a chemical term, which signifies the resolution of bodies into their component parts, to shew the nature, properties, and uses, of the various subjects of the animal, vegetable, and mineral kingdoms.

Chemists make use of two modes of analysis: first, by fire; secondly, by *menstrua*. Indeed the modes of decompounding bodies are all founded on the difference of the properties belonging to the different principles of which the body to be analysed is composed. Suppose, for instance, a body to be composed of several principles possessed of different degrees of volatility, and of some which are fixed: the volatile parts will rise in proportion to the degrees of volatility which they possess; the most volatile first, on the application of gradual heat; then the next in degree; whilst the fixed, capable of resisting the action of the fire, will remain at the bottom of the vessel. This is called *analysis by fire.* But when a body is compounded of several substances, one of which, for instance, is soluble only by spirits of wine, a second is soluble only by water, and a third is soluble only by æther; these substances may be very easily separated from each other, by submitting successively the compound body to the action of these menstrua, each of which dissolves that particular substance to which it has an affinity, and from which it may afterwards be readily separated. This is called the *analysis by menstrua.* See SYNTHESIS.

ANANAS, an Indian fruit; the egg-shaped pineapple. The plant which affords this fruit, is the *bromelia ananas foliis ciliato-spinosis mucronatis spica comosa* Linn. It is used principally as a delicacy for the table, and is also given with advantage as a refrigerant in febrile complaints.

ANAPHALANTIASIS, (αναφαλαντιασις; from αναφαλαντος, bald); a thinness of the hair upon the eye-brows.

ANAPHRODISIA, (from α priv. and αφροδισια, *venery)*; impotence with respect to venereal commerce. Dr. Cullen makes this a genus of disease, in the class *Locales*, and order *Dysorexiæ.* See IMPOTENCE.

A'NAS DOMESTICA; the tame duck. The flesh of this bird is difficult of digestion, and requires that warm and stimulating condiments be taken with it to enable the stomach to act on it. See ANSERES.

ANASA'RCA, (from ανα, *through;* and σαρξ, *flesh*, or in the flesh); a species of dropsy from a serous fluid between the skin and flesh, or rather a general accumulation of lymph in the cellular membrane.

Dr. Cullen ranks this genus of disease, in the class *Cachexia*, and the order *Intumescentia.* He enumerates the following species, *viz.* 1. *Anasarca serosa*, as when the due discharge of serum is suppressed, &c. 2. *Anasarca oppilata*, as when the blood-vessels are considerably pressed, which happens to many pregnant women, &c. 3. *Anasarca exanthematica;* this happens after ulcers, various eruptive disorders, and particularly after the *erysipelas.* 4. *Anasarca analmia*, happens when the blood is rendered extremely poor from considerable hæmorrhages. 5. *Anasarca debilium*, as when feebleness is induced by long sickness, &c.

In this disease the feet first begin to swell, especially in the evening after exercise, and when the patient has stood or sat long; which swelling rises frequently to the thighs. On lying in bed, the swelling becomes less, or even almost disappears. In the progress of the disease, the swelling often rises to the hips, loins, and belly, and at last co-

vers the whole body. This disease, besides the other symptoms common to ascites (See ASCITES), is attended with a remarkable difficulty of breathing. In the cure of this, as well as other species of dropsy, the general intentions are, first, the evacuation of the water already effused, either by natural or artificial outlets; and, secondly, the prevention of it from accumulation, which is chiefly to be expected from supporting a due action of the absorbents, and from keeping up a proper discharge by the serous excretories

The remedies employed with these intentions are much the same with what are employed in curing the more important genus already alluded to; nevertheless, we shall here give in detail, with some variations, the treatment usually recommended. The two following indications require attention: *first*, the evacuation of the collected fluid; *secondly*, the removal of the remote causes, or their effects.

The first may possibly be obtained,

1. By scarifications, which should not be made large, as they may become gangrenous, to which there is always a tendency in this disease.
2. By blisters, which should be used early, and with caution, for the reasons just mentioned.
3. By issues, which may be made, under the same precautions, below one or both knees.
4. By the application of colewort leaves to the legs and thighs, repeated occasionally as they become imbued with moisture.
5. By bandages applied to the extremities.
6. By exhibiting the *digitalis purpurea*, which has done remarkable things in this disease.
7. By diaphoretics.
8. By stimulants.
9. By sialogogues.
10. By drastic purges.
11. By emetics.

First, as evacuants, we may employ remedies of this kind:

℞. Vin. ipecac. ℥iss.
Antim. tartaris. gr. ij.
M. f. haust. alternis diebus sumend. Or,

℞. Pulv. scill. sicc. gr. iij. ad iv.
Pulv. aromatic. gr. iij.
Sacch. alb. gr. vj.
M. f. pulv. h. s. et mane, quotidie sumend. Or,

℞. Oxymel. scill. ℥iss.
Vin. antimon. ʒj.
M. f. haust. emetic. secunda quaque die sumend.

The most suitable purgatives are the following:

℞. Pil. e. colocynth. c. ℈j.
Ol. juniper. gtt. ij.
M. f. pilul. v. pro dos. alternis diebus cum regimine sumend. Or,

℞. Pulv. jalap.
Pulv. scammon. āā gr. xv.
Ol. cinamom. gtt. j. M. f. pulv. purg. Or,

℞. Pulv. jalap. gr. xv.
Gum. gambog.
Calomel. ppt. āā gr. v.
Ol. menth. ess. gtt. j. M. f. pulv. purg. Or,

℞. Elaterii gr. j. ad ij. ad iij.
Syr. simp. q. s. ut fiat pilula. Or,

℞. Chryst. tartari ℥j. ad ℥iss.
Aq. fervent. ℔j. Mane sumend. alternis diebus.

This last is a powerful medicine in dropsy, and acts as a purgative or diuretic, and sometimes in both ways. To direct its operation more certainly to the urinary organs, it will be adviseable to give plentifully of tepid liquids after it; or the same effect may be produced by giving the same quantity in divided doses, at short intervals, until the whole is taken.

To promote a diaphoresis is generally a difficult task in this disease. This action of the vessels, however, upon the surface of the body, must be attempted by friction, giving small doses of antimon. tartaris. and ordering the patient to wear flannel over the whole body.

Or sweating may be induced by the following:

℞. Pulv. ipecac. comp. gr. xv. ad ℈j.
Hora decubitus sumend.

In this process the patient should lie between blankets; the sweating should be kept up twenty-four hours at least, supporting him during the operation by frequent draughts of tepid liquids.

Stimulants are also proper under certain circumstances of anasarca, but the choice of them must be left to the judgment of the practitioner.

In effecting the *second* indication, we must distinguish between the remote causes which still exist, and those which remain as the effects of others already removed.

1. Of the first kind are morbid affections of the abdominal and thoracic viscera, intemperance, exposure to a moist atmosphere, and immersion of part of the body in water.

2. Among the second may be numbered debility, induced by large evacuations, long continued intermittent fevers, and the use of spirituous liquors, the effects remaining, although the practice

may be discontinued. Inflammation of internal surfaces.

The diseases of the viscera may be of different kinds, and must be treated in the manner pointed out under the several heads to which they belong.

The debility and loss of tone of the system are to be removed by carefully shunning their causes; by tonic medicines, by exercise, and by supporting the integuments of the lower extremities by bandages. A diligent friction of the legs every morning should be used.

In many cases, it will be proper to join diuretics with tonics; in which event, the following formulæ are worth attending to:

℞. Decoct. cinchonæ, vel
Infus. amar. simp. ℥vj.
Aq. fœnic. ℥j.
Kali acetat. ʒij.
M. f. mist. sumat cochl. iv. ter in die. Or,

℞. Infus. cort. Angustur. ℥iss.
Aq. anethi ʒj.
Tinct. canthar. gtt. xv. ad xxv.
M. f. haust. ter in die sumend. Or,

℞. Pilul. aromat.
Pulv. rhab. aa ʒj.
Pulv. scill. sicc. gr. vj.
Ol. juniperi gtts. vj.
Syr. simp. q. s.
M. f. pill. No. xxiv. quarum capt. iij. bis in die superb haust. sequent.

℞. Infus. quassiæ ℥iss.
Tinct. cort. Peruv. ʒj. m. f. haust. Or,

℞. Ferri vitriol.
Myrrh. in pulv. trit.
Extract. cinchonæ aa ʒj.
Kali præp. ʒss.
Syr. q. s.
M. f. pil. xlii. dos. ij.—iv. ter quaterve in die. Or,

℞. Myrrh. in pulv. trit. gr. xv.
Ferri vitriol. gr. v.
Kali præp. gr. x.
Aquæ puræ ℥iss.
Tinct. cardamom. ʒiss. m. f. haustus.

The manner of exhibiting the *digitalis purpurea* is described under Digitalis.

In anasarca, it is usual to scarify the feet and legs. By this means the water is often discharged: but the operator must be cautious not to make the incisions too deep; they ought barely to penetrate through the skin; and especial care must be taken, by spirituous fomentations and proper dressings, to prevent a gangrene. Dr. Fothergill has observed, that the safest and most efficacious way of making these drains, is by the instrument used with cupping, called a *scarificator;* and he always ordered it to be so applied as to make the little wounds *transversely;* as they not only discharge better, but are also longer in healing, than when made longitudinally.

Notwithstanding every precaution, however, gangrene will often ensue; and it is, upon the whole, a much safer practice to evacuate the water by those natural outlets, the valvular lymphatic absorbents; and with this intention, emetics and cathartics, but particularly diuretics, are often employed with success.

ANASPA'SIS, (from ανα, and σπαω, *to draw).* Hippocrates uses this word to express a contraction of the stomach.

ANA'SSUTOS, (from ανα, for ανω, *upwards*, and σευομαι, *to move).* Hippocrates connects this word as an epithet with air, or flatus, when speaking of the suffocation observed in hysteric fits, and the air, rushing out with violence from the stomach.

ANASTA'LTICA, (αναςταλτικα; from αναστελλω, *to contract);* styptics, or astringents.

ANASTOICHEIO'SIS, (from ανα, and στοιχειον, *a principle* or *element);* a resolution of a body into the elements of which it was composed:—a colliquation, resolution, or dissolution, of the solids or fluids of the body.

ANASTOMO'SIS, *(Anastomosis, is,* f. αναςομωσις; from ανα, *through*, and ςομα, *a mouth);* inosculation, or the communication of vessels with one another by their minutest extremities. The term anastomsis, however, in its strictest sense, is applicable principally to the junction formed between the termination of arteries and the beginning of veins, or to those mouths through which the arterial blood is transmitted into the veins, and to be returned to the heart. But it has been employed synonimously with inosculartion; and in that general sense, denotes the conjunction of different vessels of any denomination and dimension.

Mr. Bell, in his "*Principles of Surgery*", observes, that the *system of inosculation* is one of the numerous beautiful contrivances of nature for providing a remedy against some of the most dangerous injuries to which the human body is exposed; namely, interruption of the circulation through the great arteries, whether by disease or external violence. In all these cases it is well known, that the blood, going to any of the extremities, if obstructed in its usual channel, finds its way through the minute inosculating branches given off from the larger artery above the point of obstruction, and thus supports the circulation necessary to the life of the parts, at first languidly, till these inosculating branches gradually enlarge, and, from being secondary and subordinate ramifications, assume the office of principal branches, and at last become fully adequate to the purposes of life, growth, and perfect nutrition.

Indeed, this important fact in the animal economy is now fully understood, and the valuable conclusions in the practice of surgery to be derived from it, particularly with regard to the comparative safety of tying the larger arterial trunks, are familiar. Mr. Bell, in his work, has described anatomically the *individual inosculations* of the several branches of the circulating system, and lays particular stress upon three points in the arterial distribution which more peculiarly illustrate the doctrine of inosculation. These are the following:

1. The communication between the axillary and the femoral arteries through the internal mammary, a branch of the former, which inosculates with the epigastric, a ramification of the latter. This arterial union between parts so widely distant as the upper and lower extremities, is of peculiar interest, as it has been known to supply, in some degree, the want of an aorta, as is proved by a case cited by the author, Mr. Paris, of the Hotel Dieu, who found, in a subject which he injected, a remarkable contraction of the aorta a little below the arch, a consequent unusual enlargement of the arteries on the fore part of the chest, and a complete inosculation of the dilated mammary with the equally enlarged epigastric arteries.

2. The collateral branches belonging to the arteries of each extremity separately considered, and which are sufficient to keep up the circulation in the limb when the principal trunk is obstructed. Thus, the subclavian artery, before entering the axilla, sends off the thyroid and cervical arteries, which ramify round the joint, and mix their extreme branches with those which come off from the brachial artery, as may be shewn by tying the axillary artery and injecting the subclavian from within the thorax, when the wax will be found to run freely into the brachial artery below the ligature in the axilla. In like manner, in the lower extremity, the ischiatic, thyroid, and pudic arteries, inosculate with ramifications from the profunda, and will supply the circulation when the external iliac artery is obstructed.

3. The lower joints of each extremity, the elbow and knee, are surrounded with their particular inosculations, which, though naturally more minute than those of the upper joints, so as to be shewn with difficulty by injections, are nevertheless capable of such rapid enlargement after obliteration of the larger arteries, as to supply the lower parts of the limb with perfect ease; as has been proved in numerous instances of operation for aneurism and other surgical cases, where it has been requisite to obstruct the larger arterial trunks.

Much has been done, in a physiological point of view, by Mr. Hunter's operation for aneurism, (See Aneurism), in explaining the vast resources for the nutriment of limbs, which nature possesses, in the power of rapidly enlarging inosculating branches, and converting them into principal channels for the blood when the main trunks have been obliterated. See Arteries.

ANATOMY, (*anatomia*, ανατομια, or ανατομη; from ανα, and τεμνω, *to cut up*); the dissection of the human body, in order to expose the structure, situation, and uses of every part.

The etymology of the word *anatomy*, as above given, implies simply *dissection;* but by this term something more is usually understood. It is every day made use of to express a knowledge of the human body; and a person who is said to understand anatomy, is supposed to be conversant with the structure and arrangement of the different solid parts of the body. It is commonly divided into *Anatomy*, properly so called; and *Comparative* Anatomy: the first of these is confined solely to the human body; the latter includes all animals, so far as a knowledge of their structure may tend to perfect our ideas of the human body. See Comparative Anatomy.

The term *anatomy* may also have another and more extensive signification: it may be employed to express not only a knowledge of the structure and disposition of the parts, but likewise of their œconomy and uses. Considered in this light, it will seldom fail to excite the curiosity of people of taste, as a branch of philosophy; since, if it is pleasing to be acquainted with the structure of the body, it is certainly more so to discover all the springs which give life and motion to the machine, and to observe the admirable mechanism by which so many different functions are executed.

Astronomy and anatomy, as Dr. Hunter, after Fontenelle, observes, are studies which present us with the most striking view of the two greatest attributes of the Supreme Being. The first of these fills the mind with the idea of immensity, in the largeness, distances, and number of the heavenly bodies; the last, astonishes with his intelligence and art in the variety and delicacy of animal mechanism.

The human body has been commonly enough known by the name of *microcosmus*, or the little world; as if it did not differ so much, from the universal system of nature, in the symmetry and number of its parts as in their size.

1. The art *of Anatomy* seems to have been very ancient; though, for a long time, known only in an imperfect manner. The first men who lived must have soon acquired some notions of the structure of their own bodies, particularly of the internal parts, and of some even of the external, such as bones, joints, and sinews, which are exposed to the examination of the senses in living bodies.

This rude knowledge must have been gradually improved, by the accidents to which the body is exposed, by the necessities of life, and by the

various customs, ceremonies, and superstitions, of different nations. Thus, the observance of bodies killed by violence, attention to wounded men, and to many diseases, the various ways of putting criminals to death, the funeral ceremonies, and a variety of such things, must have shown men every day more and more of themselves; especially as curiosity and self-love would here urge them powerfully to observation and reflection. The brute creation having such an affinity to man in outward form, motions, senses, and ways of life; the generation of the species, and the effect of death upon the body, being observed to be so nearly the same in both; the conclusion was not only obvious, but unavoidable, that their bodies were formed nearly upon the same model. And the opportunities of examining the bodies of brutes were so easily procured, indeed so necessarily occurred in the common business of life, that the huntsman in making use of his prey, the priest in sacrificing, the augur in divination, and, above all, the butcher, or those who might, out of curiosity, attend upon his operations, must have been daily adding to the little stock of anatomical knowledge.

In tracing it backwards to its infancy, however, we cannot go farther into antiquity than the times of the Grecian philosophers. As an art in a state of some cultivation, it may be said to have been brought forth and bred up among them as a branch of natural knowledge.

The æra of philosophy, as it was called, began with Thales the Milesian being declared, by a very general consent of the people, the most wise of all the Grecians, 480 years before Christ. The philosophers of his school, which was called the Ionian, cultivated principally natural knowledge. Socrates, the seventh in succession of their great teachers, introduced the study of morals, and was thence said to bring down philosophy from heaven, to make men truly wise and happy.

In the writings of his scholar and successor Plato, we see that the philosophers had carefully considered the human body, both in its organization and functions; and though they had not arrived at the knowledge of the more minute and intricate parts, which required the successive labour and attention of many ages, they had formed very noble and comprehensive ideas of the subject in general. The anatomical descriptions of Xenophon and Plato have had the honour of being quoted by Longinus as specimens of sublime writing; and the extract from Plato is still more remarkable for its containing the rudiments of the circulation of the blood. "The heart (says Plato) is the centre or knot of the blood-vessels; the spring or fountain of the blood, which is carried impetuously round: the blood is the *pabulum* or food of the flesh; and, for the purpose of nourishment, the body is laid out into canals, like those which are drawn through gardens, that the blood may be conveyed, as from a fountain, to every pervious part of the body."

Hippocrates was nearly contemporary with the great philosophers of whom we have been speaking, about 400 years before the Christian æra. He is said to have separated the profession of philosophy and physic, and to have been the first who applied to physic alone as the business of his life. He is likewise generally supposed to be the first who wrote upon anatomy. We know of nothing that was written expressly upon the subject before; and the first anatomical dissection which has been recorded was made by his friend Democritus of Abdera.

If, however, we read the works of Hippocrates with impartiality, and apply his accounts of the parts to what we now know of the human body, we must allow his descriptions to be imperfect, incorrect, sometimes extravagant, and often unintelligible, that of the bones only excepted. He seems to have studied these with more success than the other parts, and tells us that he had an opportunity of seeing a human skeleton.

From Hippocrates to Galen, who flourished towards the end of the second century, in the decline of the Roman empire, that is, in the space of 600 years, anatomy was greatly improved; the philosophers still considering it as a most curious and interesting branch of natural knowledge, and the physicians as a principal foundation of their art. Both of them, in that interval of time, contributed daily to the common stock, by more accurate and extended observations, and by the lights of an improving philosophy.

As these two great men had applied very particularly to the study of animal bodies, they not only made great improvements, especially in physiology, but raised the credit of natural knowledge, and spread it as wide as Alexander's empire.

Few of Aristotle's writings were made public in his lifetime. He affected to say, that they would be unintelligible to those who had not heard them explained at his lectures: and, except the use which Theophrastus made of them, they were lost to the public for above 130 years after the death of Theophrastus; and at last came out defective from bad preservation, and corrupted by men, who, without proper qualifications, presumed to correct and to supply what was lost.

From the time of Theophrastus, the study of natural knowledge at Athens was for ever on the decline; and the reputation of the Lycæum and Academy was almost confined to the studies which are subservient to oratory and public speaking.

The other great institution for Grecian education was at Alexandria in Egypt. The first Ptolemies, both from their love of literature, and to give true and permanent dignity to their empire,

and to Alexander's favourite city, set up a grand school in the palace itself, with a museum and a library, which, we may say, has been the most famed in the world. Anatomy, among other sciences, was publicly taught; and the two distinguished anatomists were Erasistratus the pupil and friend of Theophrastus, and Herophilus. Their voluminous works are all lost; but they are quoted by Galen almost in every page. These professors were probably the first who were authorized to dissect human bodies; a peculiarity which marks strongly the philosophical magnanimity of the first Ptolemy, and fixes a great æra in the history of anatomy. And it was, no doubt, from this particular advantage which the Alexandrians had above all others, that their school not only gained, but for many centuries preserved, the first reputation for medical education. Ammianus Marcellinus, who lived about 650 years after the schools were set up, says, they were so famous in his time, that it was enough to secure credit to any physician if he could say that he had studied at Alexandria.

Herophilus has been said to have anatomatized 700 bodies: but we must allow for exaggeration. Nay, it was said, that both he and Erasistratus made it a common practice to open living bodies, that they might discover the more secret springs of life. But this, no doubt, was only a vulgar opinion, arising from the prejudices of mankind; and accordingly, without any good reason, such tales have been told of modern anatomists, and have been believed by the vulgar.

Among the Romans, though it is probable they had physicians and surgeons from the foundation of the city, yet we have no account of these applying themselves to anatomy for a very long time. Archagathus was the first Greek physician established in Rome, and he was banished the city on account of the severity of his operations.—Asclepiades, who flourished in Rome 101 years after Archagathus, in the time of Pompey, attained such a high reputation as to be ranked in the same class with Hippocrates. He seemed to have some notion of the air in respiration acting by its weight; and in accounting for digestion, he supposed the food to be no farther changed than by a comminution into extremely small parts, which being distributed to the several parts of the body, is assimilated to the nature of each. One Cassius, commonly thought to be a disciple of Asclepiades, accounted for the right side of the body becoming paralytic on hurting the left side of the brain, in the same manner as has been done by the moderns, viz. from the crossing of the nerves from the right to the left side of the brain.

From the time of Asclepiades to the second century, physicians seem to have been greatly encouraged at Rome; and in the writings of Celsus, Rufus, Pliny, Cœlius Aurelianus, and Aretæus, we find several anatomical observations, but mostly very superficial and inaccurate. Towards the end of the second century lived Claudius Galenus Pergamus, whose name is so well known in the medical world. He applied himself particularly to the study of anatomy, and did more in that way than all that went before him. He seems, however, to have been at a great loss for human subjects to operate upon; and therefore his descriptions of the parts are mostly taken from brute animals. His works contain the fullest history of anatomists, and the most complete system of the science, to be met with any where before him, or for several centuries after; so that a number of passages in them were reckoned absolutely unintelligible for many ages, until explained by the discoveries of succeeding anatomists.

About the end of the fourth century, Nimesius bishop of Emissa wrote a treatise on the nature of man, in which it is said were contained two celebrated modern discoveries; the one, the uses of the bile, boasted of by Sylvius de la Boe; and the other, the circulation of the blood. This last, however, is proved by Dr. Freind, in his History of Physic, p. 229, to be falsely ascribed to this author.

The Roman empire beginning now to be oppressed by the barbarians, and sunk in gross superstition, learning of all kinds decreased; and when the empire was totally overwhelmed by those barbarous nations, every appearance of science was almost extinguished in Europe. The only remains of it were among the Arabians in Spain and in Asia.—The Saracens, who came into Spain, destroyed at first all the Greek books which the Vandals had spared: but though their government was in a constant struggle and fluctuation during 800 years before they were driven out, they received a taste for learning from their countrymen of the east; several of their princes encouraged liberal studies; public schools were set up at Cordova, Toledo, and other towns, and translations of the Greeks into the Arabic were universally in the hands of their teachers.

Thus was the learning of the Grecians transferred to the Arabians. But though they had so good a foundation to build upon, this art was never improved while they were masters of the world: for they were satisfied with commenting upon Galen: and seem to have made no dissections of human bodies.

Abdollaliph, who was himself a teacher of anatomy, a man eminent in his time (at and before 1203) for his learning and curiosity; a great traveller, who had been bred at Bagdad, and had seen many of the great cities and principal places for study in the Saracen empire; who had a favourable opinion of original observation, in opposition to book-learning; who boldly corrected

some of Galen's errors, and was persuaded that many more might be detected; this man, we say, never made or saw, or seemed even to think of a human dissection. He discovered Galen's errors in the osteology, by going to burying grounds, with his students and others, where he examined and demonstrated the bones; he earnestly recommended that method of study, in preference even to the reading of Galen, and thought that many farther improvements might be made; yet he seemed not to have an idea that a fresh subject might be dissected with that view.

Perhaps the Jewish tenets which Mahometans adopted about uncleanness and pollution, might prevent their handling dead bodies; or their opinion of what was supposed to pass between an angel and the dead person, might make them think disturbing the dead highly sacrilegious. Such, however, as Arabian learning was, for many ages together there was hardly any other in all the western countries of Europe. It was introduced by the establishment of the Saracens in Spain in 711, and kept its ground till the restoration of learning in the end of the 15th century. The state of anatomy in Europe, in the times of Arabian influence, may be seen by reading a very short system of anatomy drawn up by Mundinus, in the year 1315. It was extracted principally from what the Arabians had preserved of Galen's doctrine; and, rude as it is, in that age, it was judged to be so masterly a performance, that it was ordered by a public decree, that it should be read in all the schools of Italy; and it actually continued to be almost the only book which was read upon the subject for above 200 years. Cortesius gives him the credit of being the great restorer of anatomy, and the first who dissected human bodies among the moderns.

A general prejudice against dissection, however, prevailed till the 16th century. The emperor Charles V. ordered a consultation to be held by the divines of Salamanca, in order to determine whether or not it was lawful in point of conscience to dissect a dead body. In Muscovy, till very lately, both anatomy and the use of skeletons were forbidden, the first as inhuman, and the latter as subservient to witchcraft.

In the beginning of the 15th century, learning revived considerably in Europe, and particularly physic, by means of copies of the Greek authors brought from the sack of Constantinople; after which the number of anatomists and anatomical books increased to a prodigious degree.—The Europeans becoming thus possessed of the ancient Greek fathers of medicine, were for a long time so much occupied in correcting the copies they could obtain, studying the meaning, and commenting upon them, that they attempted nothing of their own, especially in anatomy.

And here the late Dr. Hunter introduced into the annals of this art, a genius of the first rate, Leonardo da Vinci, who had been formerly overlooked, because he was of another profession, and because he published nothing upon the subject. He is considered by the Doctor as by far the best anatomist and physiologist of his time; and was certainly the first man we know of who introduced the practice of making anatomical drawings.

Vassare, in his lives of the painters, speaks of Leonardo thus, after telling us that he had composed a book of the anatomy of a horse, for his own study: "he afterwards applied himself with more diligence to the human anatomy; in which study he reciprocally received and communicated assistance to Marc. Antonio della Torre, an excellent philosopher, who then read lectures in Pavia, and wrote upon this subject; and who was the first, as I have heard, who began to illustrate medicine from the doctrine of Galen, and to give true light to anatomy, which till that time had been involved in clouds of darkness and ignorance. In this he availed himself exceedingly of the genius and labour of Leonardo, who made a book of studies, drawn with red chalk, and touched with a pen, with great diligence, of such subjects as he had himself dissected; where he made all the bones, and to those he joined, in their order, all the nerves, and covered them with the muscles. And concerning those, from part to part, he wrote remarks in letters of an ugly form, which are written by the left hand, backwards, and not to be understood but by those who know the method of reading them; for they are not to be read without a looking-glass. Of these papers of the human anatomy, there is a great part in the possession of M. Francesco da Melzo, a Milanese gentleman, who, in the time of Leonardo, was a most beautiful boy, and much beloved by him, as he is now a beautiful and genteel old man, who reads those writings, and carefully preserves them, as precious relics, together with the portrait of Leonardo, of happy memory. It appears impossible that that divine spirit should reason so well upon the arteries, and muscles, and nerves, and veins; and with such diligence of every thing, &c. &c."

Those very drawings, and the writings, are happily found to be preserved in his Majesty's great collection of original drawings, where the Doctor was permitted to examine them; and his sentiments upon the occasion he thus expresses; "I expected to see little more than such designs in anatomy as might be useful to a painter in his own profession; but I saw, and indeed with astonishment, that Leonardo had been a general and a deep student. When I consider what pains he has taken upon every part of the body, the superiority of his universal genius, his particular excellence in mechanics and hydraulics, and the attention with which such a man would examine and see objects

which he was to draw, I am fully persuaded that Leonardo was the best anatomist at that time in the world. We must give the 15th century the credit of Leonardo's anatomical studies, as he was 55 years of age at the close of that century."

In the beginning of the 16th century, Achillinus and Benedictus, but particularly Berengarius and Massa, followed out the improvement of anatomy in Italy, where they taught it, and published upon the subject. These first improvers made some discoveries from their own dissections: but it is not surprising that they should have been diffident of themselves, and have followed Galen almost blindly, when his authority had been so long established, and when the enthusiasm for Greek authors was rising to such a pitch.

Soon after this, we may say about the year 1540, the great Vesalius appeared. He was studious, laborious, and ambitious. From Brussels, the place of his birth, he went to Louvain, and thence to Paris, where anatomy was not yet making a considerable figure, and again to Louvain to teach; from which place, very fortunately for his reputation, he was called to Italy, where he met with every opportunity that such a genius for anatomy could desire, that is, books, subjects, and excellent draughtsmen. He was equally laborious in reading the ancients, and in dissecting bodies. And in making the comparison, he could not but see, that there was great room for improvement, and that many of Galen's descriptions were erroneous. When he was but a young man, he published a noble system of anatomy, illustrated with a great number of elegant figures. In this work he found so many occasions of correcting Galen, that his contemporaries, partial to antiquity, and jealous of his reputation, complained that he carried his turn for improvement and criticism to licentiousness. The spirit of opposition and emulation was presently roused; and Sylvius in France, Columbus, Fallopius, and Eustachius in Italy, who were all in high anatomical reputation about the middle of this 16th century, endeavoured to defend Galen at the expence of Vesalius. In their disputes they made their appeals to the human body: and thus in a few years the art was greatly improved. And Vesalius being detected in the very fault which he condemns in Galen, to wit, describing from the dissections of brutes, and not of the human body, it exposed so fully that blunder of the older anatomists, that in succeeding times there has been little reason for such complaint.—Besides the above, he published several other anatomical treatises. He has been particularly serviceable by imposing names on the muscles, most of which are retained to this day. Formerly these were distinguished by numbers, which were differently applied by almost every author.

In 1561, Gabriel Fallopius, professor of anatomy at Padua, published a treatise of anatomy under the title of *Observationes Anatomicæ*. This was designed as a supplement to Vesalius; many of whose descriptions he corrects, though he always makes mention of him in an honourable manner. Fallopius made many great discoveries, and his book is well worth the perusal of every anatomist.

In 1563, Bartholomæus Eustachius published his *Opuscula Anatomica* at Venice, which have ever since been justly admired for the exactness of the descriptions, and the discoveries contained in them. He published afterwards some other pieces, in which there is little of anatomy; but never published the great work he had promised, which was to be adorned with copperplates representing all the parts of the human body. These plates, after lying buried in an old cabinet for upwards of 150 years, were at last discovered and published in the year 1714, by Lancifi the pope's physician; who added a short explicatory text, because Eustachius's own writing could not be found.

From this time the study of anatomy gradually diffused itself over Europe: insomuch that for the last hundred years it has been daily improving by the labour of a number of professed anatomists almost in every country of Europe.

We may form a judgment about the state of anatomy even in Italy, in the beginning of the 17th century, from the information of Cortesius. He had been professor of anatomy at Bologna, and was then professor of medicine at Massana; where, though he had a great desire to improve himself in the art, and to finish a treatise which he had begun on practical anatomy, in 24 years he could twice only procure an opportunity of dissecting a human body, and then it was with difficulty and in a hurry; whereas he had expected to have done so, he says, *once every year, according to the custom in the famous academies of Italy.*

In the very end of the 16th century, our great Harvey, as was the custom of the times, went to Italy to study medicine; for Italy was still the favourite seat of the arts: and in the very beginning of the 17th century, soon after Harvey's return to England, his master in anatomy, Fabricius ab Aquapendente, published an account of the valves in the veins, which he had discovered many years before, and no doubt taught in his lectures when Harvey attended them.

This discovery evidently affected the established doctrine of all ages, that the veins carried the blood from the liver to all parts of the body for nourishment. It set Harvey to work upon the use of the heart and vascular system in animals; and in the course of some years he was so happy as to discover, and to prove beyond all possibility of doubt, the *circulation of the blood.* He taught his new doctrine in his lectures about the year 1616, and printed it in 1628.

It was by far the most important step that has been made in the knowledge of animal bodies in any age. It not only reflected useful lights upon what had been already found out in anatomy, but also pointed out the means of further investigation. And accordingly we see, that from Harvey to the present time, anatomy has been so much improved, that we may reasonably question if the ancients have been further outdone by the moderns in any other branch of knowledge. From one day to another there has been a constant succession of discoveries, relating either to the structure or functions of our body; and new anatomical processes, both of investigation and demonstration, have been daily invented. Many parts of the body which were not known in Harvey's time have since then been brought to light: and of those which were known, the internal composition and functions remained unexplained; and indeed must have remained inexplicable without the knowledge of the circulation.

Harvey's doctrine at first met with considerable opposition; but in the space of about 20 years it was so generally and so warmly embraced, that it was imagined every thing in physic would be explained. But time and experience have taught us, that we still are, and probably must long continue to be very ignorant; and that in the study of the human body, and of its diseases, there will always be an extensive field for the exercise of sagacity.

After the discovery and knowledge of the circulation of the blood, the next question would naturally have been about the passage and route of the nutritious part of the food, or chyle, from the bowels to the blood-vessels: and, by good fortune, in a few years after Harvey had made his discovery, Asellius, an Italian physician, found out the lacteals, or vessels which carry the chyle from the intestines; and printed his account of them, with coloured prints, in the year 1627, the very year before Harvey's book came out.

For a number of years after these two publications, the anatomists in all parts of Europe were daily opening living dogs, either to see the lacteals or to observe the phenomena of the circulation. In making an experiment of this kind, Pecquet, in France, was fortunate enough to discover the thoracic duct, or common trunk of all the lacteals, which conveys the chyle into the subclavian vein. He printed his discovery in the year 1651. And now the lacteals having been traced from the intestines to the thoracic duct, and that duct having been traced to its termination in a blood-vessel, the passage of the chyle was completely made out.

The same practice of opening living animals furnished occasions of discovering the lymphatic vessels. This good fortune fell first to the lot of Rudbec, a young Swedish anatomist; and then to Thomas Bartholine, a Danish anatomist, who was the first who appeared in print upon the lymphatics. His book came out in the year 1653, that is two years after that of Pecquet. And then it was very evident that they had been seen before by Dr. Highmore and others, who had mistaken them for lacteals. But none of the anatomists of those times could make out the origin of the lymphatics, and none of the physiologists could give a satisfactory account of their use.

The circulation of the blood and the passage of the chyle having been satisfactorily traced out in full grown animals, the anatomists were naturally led next to consider how these animal processes were carried on in the child while in the womb of the mother. Accordingly the male and female organs, the appearances and contents of the pregnant uterus, the incubated egg, and every phenomenon which could illustrate generation, became the favourite subject for about 30 years with the principal anatomists of Europe.

Thus it would appear to have been in theory: but Dr. Hunter believes that, in fact, as Harvey's master Fabricius laid the foundation for the discovery of the circulation of the blood by teaching him the valves of the veins, and thereby inviting him to consider that subject; so Fabricius, by his lectures, and by his elegant work, *De Formato Fœtu, et de Formatione Ovi et Pulli*, probably made that likewise a favourite subject with Dr. Harvey. But whether he took up the subject of generation in consequence of his discovery of the circulation, or was led to it by his honoured master Fabricius, he spent a great deal of his time in the inquiry; and published his observations in a book, *De Generatione Animalium*, in the year 1651, that is, six years before his death.

In a few years after this, Swammerdam, Van Horn, Steno, and De Graaf, excited great attention to the subject of generation, by their supposed discovery that the females of viviparous animals have ovaria, that is, clusters of eggs in their loins, like oviparous animals; which, when impregnated by the male, are conveyed into the uterus; so that a child is produced from an egg as well as a chick; with this difference, that one is hatched within, and the other without, the body of the mother.

Malphigi, a great Italian genius, some time after, made considerable advances upon the subject of generation. He had the good fortune to be the first who used magnifying glasses with address in tracing the first appearances in the formation of animals. He likewise made many other observations and improvements in the *minutiæ* of anatomy by his microscopical labours, and by cultivating comparative anatomy.

This distinguished anatomist gave the first public specimen of his abilities by printing a dissertation

on the lungs, *anno* 1661; a period so remarkable for the study of nature, that it would be injustice to pass it without particular notice.

At the same time flourished Laurentius Bellinus at Florence. He was the first who introduced mathematical reasoning in physic. In 1662, Simon Pauli published a treatise, *De Albandis Ossibus*. He had long been admired for the white skeletons he prepared; and at last discovered his method, which was by exposing the bones all winter to the weather.

Johannes Swammerdam, of Amsterdam, also published some anatomical treatises; but was most remarkable for his knowledge of preserving the parts of bodies entire for many years, by injecting their vessels. He also published a treatise on respiration; wherein he mentioned his having figures of all parts of the body, as big as the life, cut in copper, which he designed to publish, with a complete system of anatomy. These, however, were never made public by Swammerdam; but, in 1683, Gothofridus Bidloo, professor of anatomy at Leyden, published a work, intitled *Anatomia Corporis Humani*, where all the parts were delineated in very large plates, almost as big as the life. Mr. Cowper, an English surgeon, bought 300 copies of these figures; and, in 1698, published them, with an English text, quite different from Bidloo's Latin one; to which were added letters in Bidloo's figures, and some few figures of Mr. Cowper's own. To this work Cowper's name was prefixed, without the least mention of Bidloo, except on purpose to confute him. Bidloo immediately published a very ill-natured pamphlet, called *Gulielmus Cowperus citatus coram Tribunale;* appealing to the Royal Society, how far Cowper ought to be punished as a plagiary of the worst kind, and endeavouring to prove him an ignorant, deceitful fellow. Cowper answered him in his own style, in a pamphlet called his *Vindiciæ;* endeavouring to prove, either that Bidloo did not understand his own tables, or that they were none of his. It was even alleged that those were the tables promised by Swammerdam, and which Bidloo had got from his widow. This, however, appears to have been only an invidious surmise, there being unquestionable evidence, that they were really the performance of Bidloo.

Soon after, Isbrandus Diembrocck, professor of anatomy at Utrecht, began to appear as an author. His work contained very little original; but he was at great pains to collect from others whatever was valuable in their writings, and his system was the common standard among anatomical students for many years.

About the same time, Antonius Liewenhoeck, of Delft, improved considerably on Malphigi's use of microscopes. These two authors took up anatomy where others had dropt it; and, by this new art, they brought a number of amazing things to light. They discovered the red globules of the blood; they were enabled to see the actual circulation of the blood in the transparent parts of living animals, and could measure the velocity of its motion; they discovered that the arteries and veins had no intermediate cells or spungy substance, as Harvey and all the preceding anatomists had supposed, but communicated one with the other by a continuation of the same tube.

Liewenhoeck was in great fame likewise for his discovery of the animalculæ in the semen. Indeed there was scarcely a part of the body, solid or fluid, which escaped his examination; and he almost every where found, that what appeared to the naked eye to be rude indigested matter, was in reality a beautiful and regular compound.

After this period, Nuck added to our knowledge of the absorbent system already mentioned, by his injection of the lympatic glands; Ruysch, in his description of the valves of the lymphatic vessels; and Dr. Meckel, by his accurate account of the whole system, and by tracing those vessels in many parts where they had not before been described.

In the last century, Drs. Hunter and Monro called the attention of the public to this part of anatomy, in their controversy concerning the discovery of the office of the lymphatics.

When the lymphatic vessels were first seen and traced into the thoracic duct, it was natural for anatomists to suspect, that, as the lacteals absorbed from the cavity of the intestines, the lymphatics, which are similar in figure and structure, might possibly do the same office with respect to other parts of the body: and accordingly Dr. Glisson, who wrote in 1654, supposes these vessels arose from cavities, and that their use was to absorb: and Frederic Hoffman has very explicitly laid down the doctrine of the lymphatic vessels being a system of absorbents. But anatomists in general have been of a contrary opinion; for from experiments, particularly such as were made by injections, they have been persuaded that the lymphatic vessels did not arise from cavities, and did not absorb, but were merely continuations from small arteries. The doctrine, therefore, that the lymphatics, like the lacteals, were absorbents, as has been suggested by Glisson and by Hoffman, has been revived by Dr. Hunter and Dr. Monro, who have controverted the experiments of their predecessors in anatomy, and have endeavoured to prove, that the lymphatic vessels are not continued from arteries, but are absorbents.

To this doctrine, however, several objections have been started, particularly by Haller (Elem. Phys. l. 24. § 2, 3.); and it has been found, that before the doctrine of the lymphatics being a system of absorbents can be established, it must first

be determined whether this system is to be found in other animals besides man and quadrupeds. Mr. Hewson claims the merit of having proved the affirmative of this question, by discovering the lymphatic system in birds, fish, and amphibious animals. See Phil. Trans. vol. lviii. and lxix. And latterly, Mr. Cruikshank has traced the ramifications of that system in almost every part of the body; and, from his dissections, figures have been made and lately published to the world. To Mr. Sheldon also we are much indebted for his illustration of this system, which promises to give great satisfaction, but of which only a part has yet been published.

The gravid uterus is a subject likewise which has received considerable improvements, particularly relating to one very important discovery; viz. that the internal membrane of the uterus, which Dr. Hunter has named *decidua*, constitutes the exterior part of the secundines or after-birth, and separates from the rest of the uterus every time that a woman either bears a child or suffers a miscarriage. This discovery includes another, to wit, that the placenta is partly made up of an excrescence or efflorescence from the uterus itself.

These discoveries are of the utmost consequence, both in the physiological question about the connexion between the mother and child, and likewise in explaining the phenomena of births and abortions, as well as in regulating obstetrical practice.

The anatomists of the 18th century have improved anatomy, and have made the study of it much more easy, by giving us more correct as well as more numerous figures. It is amazing to think of what has been done in that time. We have had four large folio books of figures of the bones, viz. Cheselden's, Albinus's, Sue's, and Trew's. Of the muscles, we have had two large folios; one from Cowper, which is elegant; and one from Albinus, which, from the accuracy and labour of the work, we may suppose will never be outdone. Of the blood-vessels, we have a large folio from Dr. Haller. We have had one upon the nerves from Dr. Meckel; and another by Dr. Monro, junior. We have had Albinus's, Roederer's, Jenty's, and Hunter's works, upon the pregnant uterus; Weitbrecht and Leber on the joints and fresh bones; Soemerring on the brain; Zinn on the eye; Cotunnius, Mekel junior, &c. on the ear; Walter on the nerves of the thorax and abdomen; Dr. Munro on the bursæ mucosæ, &c.

It would be endless to mention the anatomical figures that have been published in the last century of particular and smaller parts of the body, by Morgagni, Ruysch, Valsalva, Sanctorini, Heister, Vater, Kant, Zimmerman, Walterus, and others.

Those elegant plates of the brain, however, since published by M. Vicq. d'Azyr, must not pass without notice, especially as they form part of an universal system of anatomy and physiology, both human and comparative, proposed to be executed in the same splendid style. Upon the brain alone nineteen folio plates are employed; of which several are coloured. The figures are delineated with accuracy and clearness; but the colouring is rather beautiful than correct. Such parts of this work as may be published, cannot fail to be equally acceptable to the anatomist and the philosopher; but the entire design is apparently too extensive to be accomplished within the period of a single life.

In our own country, a very useful anatomical work is now carrying on by Mr. Andrew Bell, with the approbation of Dr. Munro, and under the inspection of his assistant Mr. Fyfe: it is to compose a complete illustration of the human body. There have also been published lately, plates of *hernia* by Mr. Astley Cooper, and some of *Morbid Anatomy*, by Dr. M. Baillie, of London. Both are strikingly elegant, and accompanied with copious explanations.

To the foreign treatises already mentioned may be added those lately published by Sabbatier and Plenck on anatomy in general. Among ourselves, the writings of Keil, Douglas, Cheselden, the first Monro, Winslow, &c. are too well known to need description. The last of these used to be recommended as a standard for the students of anatomy; but it has of late given place to a more accurate and comprehensive system, in three volumes, published by Mr. Elliot of Edinburgh, upon a plan approved of by Dr. Monro, and executed by Mr. Fyfe. Dr. Hooper, of London, has also obliged the world with an excellent system of anatomy; and an engraved work, under the title of "Plates of Anatomy and the Animal Œconomy;" in which the subjects are treated with a degree of elegance and perspicuity.

In the latter part of the 17th century, anatomy made two great steps, by the invention of injections, and the method of making what we commonly call *preparations*. (See Preparations.) These two modern arts have really been of infinite use to anatomy; and, besides, have introduced an elegance into our administrations, which, in former times, could not have been supposed possible. They arose in Holland under Swammerdam and Ruysch, and afterwards in England under Cowper, St. André, the two Hunters, Cruikshank, Hewson, and others.

The anatomists of former ages had no other knowledge of the blood-vessels than what they were able to collect from laborious dissections, and from examining the smaller branches of them, upon some lucky occasion, when they were found more than commonly loaded with red blood. But filling the vascular system with a bright coloured wax, enables us to trace the large vessels with great ease,

renders the smaller much more conspicuous, and makes thousands of the very minute ones visible, which from their delicacy, and the transparency of their natural contents, are otherwise imperceptible.

The modern art of corroding the fleshy parts with a menstruum, and of leaving the moulded wax entire, is so exceedingly useful, and at the same time so ornamental, that it does great honour to the ingenious inventor Dr. Nicholls.

The wax-work art of the moderns might deserve notice in any history of anatomy, if the masters in that way had not been so careless in their imitation. Many of the wax figures are so tawdry, with a show of unnatural colours, and so very incorrect in the circumstances of figure, situation, and the like, that, though they strike a vulgar eye with admiration, they must appear ridiculous to an anatomist. But those figures which are cast in wax, plaster, or lead, from the real subject, and which of late years have been frequently executed, are, of course, very correct in all the principal parts, and may be considered as no insignificant acquisition to modern anatomy. The proper, or principal, use of this art is, to preserve a perfect likeness of such subjects as we but seldom can meet with, or cannot well preserve in a natural state; a subject in pregnancy, for example.

The modern improved methods of preserving animal bodies, or parts of them, has been of the greatest service to anatomy; especially in saving the time and labour of the anatomist in the nicer dissections of the small parts of the body. For now, whatever he has prepared with care, he can preserve; and the object is ready to be seen at any time. And in the same manner he can preserve anatomical curiosities, or rarities of every kind; such as, parts that are uncommonly formed; parts that are diseased; the parts of the pregnant uterus and its contents. Large collections of such curiosities, which modern anatomists are striving almost every where to procure, are of infinite service to the art, especially in the hands of teachers. They give students clear ideas about many things which it is very essential to know, and yet which it is impossible that a teacher should be able to show otherwise, were he ever so well supplied with fresh subjects.

2. It is evident, that the more immediate purposes of anatomy concern those who are to be the guardians of health; as this study is necessary to to lay a foundation for all the branches of medicine.—The more we know of our fabric, the more reason we have to believe, that if our senses were more acute, and our judgment more enlarged, we should be able to trace many springs of life which are now hidden from us: by the same sagacity we should discover the true causes and nature of diseases; and thereby be enabled to restore the health of many, who are now, from our more confined knowledge, said to labour under incurable disorders. By such an intimate acquaintance with the œconomy of our bodies, we should discover even the seeds of diseases, and destroy them before they had taken root in the constitution.

That anatomy is the very basis of surgery every body allows. It is dissection alone that can teach us, where we may cut the living body with freedom and dispatch; and where we may venture with great circumspection and delicacy; and where we must not, upon any account, attempt it. This informs the *head*, gives dexterity to the *hand*, and familiarizes the *heart* with a sort of necessary inhumanity, in the use of cutting instruments upon our fellow-creatures.

Besides the knowledge of the body, through all the variety of its *structure* and *operations* in a *sound* state, it is by anatomy only that we can arrive at the knowledge of the true nature of most of the diseases which afflict humanity. The symptoms of many disorders are often equivocal; and diseases themselves are thence frequently mistaken, even by sensible, experienced, and attentive physicians. But by anatomical examination after death, we can with certainty find out the mistake, and learn to avoid it in any similar case.

This use of anatomy has been so generally adopted by the moderns, that the cases already published are almost innumerable: Mangetus, Morgagni, indeed many of the best modern writings in physic, are full of them. And if we look among the physicians of the best character, and observe those who have the *art* itself, rather than the *craft* of the profession at heart; we shall find them constantly taking pains to procure leave to examine the bodies of their patients after death.

3. After having considered the rise and progress of anatomy, and the various discoveries that have been made in it, from time to time, the following questions seem naturally to arise: For what purpose is there such a variety of parts in the human body? Why such a complication of nice and tender machinery? Why was there not rather a more simple, less delicate, and less expensive frame? The celebrated Dr. Hunter's introductory lecture will furnish answers to these queries.

"In order to acquire a satisfactory general idea of this subject," said the doctor, "let us, in our imagination, *make* a man; in other words, let us suppose that the *mind*, or immaterial part, is to be placed in a corporeal fabric, in order to hold a correspondence with other material beings by the intervention of the body; and then consider, *a priori*, what will be wanted for her accommodation." In this inquiry, we shall plainly see the necessity or advantage, and therefore the final cause, of most of the parts which we actually find in the human body. And if we consider that, in

order to answer some of the requisites, human wit and invention would be very insufficient; we need not be surprised if we meet with some parts of the body whose use we cannot yet perceive, and with some operations or functions which we cannot explain. We can see that the whole bears the most striking characters of excelling wisdom and ingenuity: but the imperfect senses and capacity of *man* cannot pretend to reach every part of a machine, which nothing less than the intelligence and power of the *Supreme Being* could contrive and execute.

First, then, the *mind*, the thinking immaterial agent, must be provided with a place of immediate residence, which shall have all the requisites for the union of spirit and body; accordingly she is provided with the *brain*, where she dwells as governor and superintendant of the whole fabric.

In the next place, as she is to hold a correspondence with all the material beings around her, she must be supplied with organs fitted to receive the different kinds of impressions which they will make. In fact, therefore, we see that she is provided with the organs of sense, as we call them: the eye is adapted to light; the ear to sound; the nose to smell; the mouth to taste; and the skin to touch.

Further: She must be furnisced with organs of communication between herself in the brain and those organs of sense, to give her information of all the impressions that are made upon them: and she must have organs between herself in the brain and every other part of the body, fitted to convey her commands and influence over the whole. For these purposes, the nerves are actually given. They are chords, which rise from the brain, the immediate residence of the mind, and disperse themselves in branches through all parts of the body. They convey all the different kinds of sensations to the mind, in the brain; and likewise carry out from thence all her commands or influence to the other parts of the body. They are intended to be occasional monitors against all such impressions as might endanger the well being of the whole, or of any particular part; which vindicates the Creator of all things, in having actually subjected us to those many disagreeable and painful sensations which we are exposed to from a thousand accidents in life.

Moreover, the mind, in this corporeal system, must be endued with the power of moving from place to place, that she may have intercourse with a variety of objects; that she may fly from such as are disagreeable, dangerous, or hurtful, and pursue such as are pleasant or useful to her. And accordingly she is furnished with limbs, and with muscles and tendons, the instruments of motion, which are found in every part of the fabric where motion is necessary.

But to support, to give firmness and shape to the fabric; to keep the softer parts in their proper places; to give fixed points for, and the proper direction to, its motions, as well as to protect some of the more important and tender organs from external injuries; there must be some firm prop-work interwoven through the whole. And, in fact, for such purposes the bones are given.

The prop-work must not be made into one rigid fabric, for that would prevent motion. Therefore there are a number of bones.

These pieces must all be firmly bound together, to prevent their dislocation. And this end is perfectly well answered by the ligaments.

The extremities of these bony pieces, where they move and rub upon one another, must have smooth and slippery surfaces for easy motion. This is most happily provided for by the cartilages and mucus of the joints.

The interstices of all these parts must be filled up with some soft and ductile matter, which shall keep them in their places, unite them, and at the same time allow them to move a little upon one another. And these purposes are answered by the cellular membrane or adipose substance.

There must be an outward covering over the whole apparatus, both to give it compactness and to defend it from a thousand injuries; which, in fact, are the very purposes of the skin and other integuments.

Lastly, The mind being formed for society and intercourse with beings of her own kind, she must be endued with powers of expressing and communicating her thoughts by some sensible marks or signs, which shall be both easy to herself, and admit of great variety; and, accordingly, she is provided with the organs and faculty of speech, by which she can throw out signs with amazing facility, and vary them without end.

Thus we have built up an animal body which would seem to be pretty complete: but, as it is the nature of matter to be altered and worked upon by matter; so, in a very little time, such a living creature must be destroyed, if there is no provision for repairing the injuries which she must commit upon herself, and those which she must be exposed to from without. Therefore a treasure of blood is actually provided in the heart and vascular system, full of nutritious and healing particles, fluid enough to penetrate into the minutest parts of the animal: impelled by the heart, and conveyed by the arteries, it washes every part, builds up what was broken down, and sweeps away the old and useless materials. Hence we see the necessity or advantage of the heart and arterial system.

What more there was of this blood than enough to repair the present damages of the machine, must not be lost, but should be returned again to the

heart; and for this purpose the venous system is actually provided. These requisites in the animal explain, *a priori*, the circulation of the blood.

The old materials, which were become useless, and are swept off by the current of blood, must be separated and thrown out of the system. Therefore glands, the organs of secretion, are given for straining whatever is redundant, vapid, or noxious, from the mass of blood; and, when strained, they are thrown out by emunctories, called organs of excretion.

But now, as the machine must be constantly wearing, the reparation must be carried on without intermission, and the strainers must always be employed. Therefore there is actually a perpetual circulation of the blood, and the secretions are always going on.

Even all this provision, however, would not be sufficient; for that store of blood would soon be consumed, and the fabric would break down, if there were not a provision made for fresh supplies. These we observe, in fact, to be profusely scattered round her in the animal and vegetable kingdoms; and she is furnished with hands, the fittest instruments that could have been contrived, for gathering them, and for preparing them in a variety of ways for the mouth.

But these supplies, which we call food, must be considerably changed: they must be converted into blood. Therefore she is provided with teeth for cutting and bruising the food, and with a stomach for melting it down: in short, with all the organs subservient to digestion.—The finer parts of the aliments only can be useful in the constitution: these must be taken up and conveyed into the blood, and the dregs must be thrown off. With this view the intestinal canal is actually given. It separates the nutritious part, which we call *chyle*, to be conveyed into the blood by the system of absorbent vessels; and the feces pass downwards, to be conducted out of the body.

Now we have got our animal not only furnished with what is wanted for its immediate existence, but also with the powers of protracting that existence to an indefinite length of time. But its duration, we may presume, must necessarily be limited; for as it is nourished, grows, and is raised up to its full strength and utmost perfection; so it must in time, in common with all material beings, begin to decay, and then hurry on to final ruin. Hence we see the necessity of a scheme for renovation. Accordingly an all-wise Providence, to perpetuate as well as preserve his work, besides giving a strong appetite for life and self-preservation, has made animals male and female, and given them such organs and passions as will secure the propagation of their species to the end of time.

Thus we see, that by the very imperfect survey which human reason is able to take of this subject, the animal man must necessarily be complex in his corporeal system, and in its operations.

He must have one great and general system, the vascular, branching through the whole for circulation: another, the nervous, with its appendages the organs of sense, for every kind of feeling: and a third, for the union and connexion of all those parts.

Besides these primary and general systems, he requires others which may be more local or confined: one for strength, support, and protection; the bony compages: another for the requisite motions of the parts among themselves, as well as for moving from place to place; the muscular part of the body: another to prepare nourishment for the daily recruit of the body; the digestive organs: and one for propagating the species; the organs of generation.

And in taking this general survey of what would appear, *a priori*, to be necessary for adapting an animal to the situations of life, we observe, with great satisfaction, that man is accordingly made of such systems, and for such purposes. He has them all; and he has nothing more except the organs of respiration. Breathing it seemed difficult to account for *a priori*: we only knew it to be in fact essentially and necessary to life. Nothwithstanding this, when we saw all the other parts of the body, and their functions, so well accounted for, and so wisely adapted to their several purposes, there could be no doubt that respiration was so likewise; and accordingly, the discoveries of Dr. Priestley have lately thrown light upon this function also, as will be shown in its proper place.

Of all the different systems in the human body, the use and necessity are not more apparent, than the wisdom and contrivance which has been exerted in putting them all into the most compact and convenient form: in disposing them so, that they shall mutually receive and give helps to one another; and that all, or many of the parts, shall not only answer their principal end or purpose, but operate successfully and usefully in a variety of secondary ways.

If we consider the whole animal machine in this light, and compare it with any machine in which human art has exerted its utmost; suppose the best constructed ship that ever was built, we shall be convinced beyond the possibility of doubt, that it is the work of intelligence and power far surpassing what humanity can boast of.

One superiority in the natural machine is peculiarly striking. In machines of human contrivance or art, there is no internal power, no principle in the machine itself, by which it can alter and accommodate itself to any injury which it may suffer, or make up any injury which admits of repair. But in the natural machine, the animal body, this is most wonderfully provided for, by

internal powers in the machine itself; many of which are not more certain and obvious in their effects, than they are above all human comprehension as to the manner and means of their operation. Thus, a wound heals up of itself; a broken bone is made firm again by a callus; a dead part is separated and thrown off; noxious juices are driven out by some of the emunctories; a redundancy is removed by some spontaneous bleeding; a bleeding naturally stops of itself; and a great loss of blood, from any cause, is in some measure compensated by a contracting power in the vascular system, which accommodates the capacity of the vessels to the quantity contained. The stomach gives information when the supplies have been expended; represents, with great exactness, the quantity and the quality of what is wanted in the present state of the machine; and in proportion as she meets with neglect, rises in her demand, urges her petition in a louder tone, and with more forcible arguments. For its protection, an animal body resists heat and cold in a very wonderful manner, and preserves an equal temperature in a burning and in a freezing atmosphere.

A farther excellence and superiority in the natural machine, if possible, still more astonishing, more beyond all human comprehension, than what we have been speaking of, is the following. Besides those internal powers of self-preservation in each individual, when two of them co-operate, or act in concert, they are endued with powers of making other animals, or machines, like themselves, which again are possessed of the same powers of producing others, and so of multiplying the species without end. These are powers which mock all human invention or imitation. They are characteristics of the divine Architect.

4. The *study of the human body*, as already noticed, is commonly divided into two parts. The first, which is called *Anatomy*, relates to the matter and structure of its parts; the second, called *Physiology* and *Animal œconomy*, relates to the principles and laws of its internal operations and functions.

As the body is a compound of solids and fluids, *anatomy* is divided into,

First, The anatomy of the solids, and

Secondly, The anatomy of the fluids.

I. The SOLIDS, by which we mean all parts of our body which are not fluid, are generally divided into two classes, viz.

1. The hard solids or bones. This part of anatomy is called *Osteology;* which signifies the doctrine of the bones.

2. The softer solids; which part is called *Sarcology*, viz. the doctrine of flesh.

This division of the solids, we may observe, has probably taken its origin from the vulgar observation, that the body is made of bone and flesh. And as there are many different kinds of what are called soft or fleshy parts, Sarcology is subdivided into,

(1) *Angeiology*, or the doctrine of vessels; by which is commonly understood *blood-vessels.*

(2.) *Adenology*, that of glands:

(3.) *Neurology*, of nerves:

(4.) *Myology*, of muscles: and,

(5.) *Splanchnology*, of the viscera or bowels. There is, besides, that part which treats of the organs of sense, and of the integuments.

This division of the solids has been here mentioned, rather for the sake of explaining so many words, which are constantly used by anatomists, than for its importance or accuracy. For besides many other objections that might be urged, there are in the body three species of solids, viz. gristle or cartilage, hair, and nails; which are of an intermediate nature between bone and flesh; and, therefore, cannot so properly be brought into the osteology or the sarcology. The cartilages are classed with the bones; because the greatest number of them are appendages to bones; and for the like reason the hair and the nails are classed with the integuments.

II. The FLUIDS of the human body may be divided into *three* kinds, which Dr. Hunter calls the *crude*, the *general* or *perfect*, and the *local* or *secreted fluids.*

1. By the *crude* fluid is meant the chyle, and whatever is absorbed at the surfaces of the body; in other words, what is recently taken into the body, and is not yet mixed with or converted into blood.

2. The *general* or *perfect* fluid is the blood itself; to wit, what is contained in the heart, arteries, and veins, and is going on in the round of the circulation.

3. The *local* or *secreted*, are those fluids peculiar to particular parts of the body, which are strained off from the blood, and yet are very different in their properties from the blood. They are commonly called *secretions;* and some are useful, others excrementitious.

In treating of these (see PHYSIOLOGY), it is very difficult to say what plan should be followed; for very method which has been yet proposed is attended with manifest inconvenience. The powers and operations of the machine have such a dependence upon one another, such connexions and reciprocal influence, that they cannot well be understood or explained separately. In this sense the body may be compared to a circular chain of powers, in which nothing is first or last, nothing solitary or independent; so that wherever we begin, we find that there is something preceding which we ought to have known. If we begin with the brain and the nerves, for example, we shall find that these cannot exist, even in idea, without the heart: if

we set out with the heart and vascular system, we shall presently be sensible, that the brain and nerves must be supposed; or, should we take up the mouth, and follow the course of the aliment, we should see that the very first organ which presented itself, supposed the existence both of the heart and brain; wherefore it seems necessary to incorporate the physiology with the anatomy, by attempting to explain the functions after we have demonstrated the organs. See the different articles under their proper heads.

ANATOMY, COMPARATIVE; zootomy, or the dissection of brute animals, fishes, polypi, &c. to illustrate, or compare them with the structure and functions of the human body. See COMPARATIVE ANATOMY.

A'NCEPS, (from *am*, on both sides, and *caput*, the head). In botany it means, forming two opposite acute angles; or, when applied to a leaf, having two opposite longitudinal angles, with a convex disk.

ANCHORA'LIS PROCESSUS, (*anchoralis*; from *αγκων*, the elbow). See CORACOID PROCESS.

ANCHOVY PEAR, an agreeable foreign fruit, the produce of the *grias cauliflora* of Linnæus. It is eaten by the inhabitants of Jamaica, as a pleasant and refrigerant remedy in febrile cases.

ANCHU'SA, (*αγχουσα*, from *αγχειν*, to *strangle*; from its supposed constringent quality; or, as others say, because it strangles serpents); alkanet. It is the *anchusa tinctoria* Linn. Alkanet is a rough hairy plant, much resembling the viper's bugloss. See BUGLOSSUM. Its chief difference from the common buglosses consists in the colour of its roots; the cortical part of which is of a dusky red, and imparts an elegant deep red to oils, wax, lard, and spirit of wine, but not to watery liquors. This plant is a native of the warmer parts of Europe: it is sometimes cultivated in our gardens; but the greatest quantities are raised in Germany and France, particularly about Montpelier, whence the dried roots are usually imported to us. The alkanet root produced in England is much inferior in colour to that brought from abroad; the English being only lightly reddish, the others of a deep purplish red: this has induced some to suspect that the foreign roots owe part of their colour to art, but, we think, without sufficient foundation.

Alkanet root has little or no smell. When recent, it has a bitterish astringent taste, but when dried, scarcely any. As to its virtues, the present practice expects not any from it. Its chief use is for colouring oils, unguents, and plasters. As the colour is confined to the cortical part, the small roots are best, these having proportionably more bark than the large.

ANCHUSA OFFICINALIS; the systematic name for the *buglossum* of the shops. See BUGLOSSUM.

ANCHYLOMERI'SMA, (*ανκυλομερισμα*, from *ανχυλομαι*, to *bend*); a term used by Sagar to express a concretion or growing together of the soft parts.

ANCHYLO'SIS, (*anchylosis*, *αγκυλωσις*; from *αγκυλομαι*, to *bend*), a stiffened joint, in consequence of bony union from inflammation. M. Percy, an associate member of the National Institute of France, read in one of its sittings, some medical and philosophical observations on a case of *universal* anchylosis, and shewed the class a skeleton of an unfortunate person, who lived twelve years in that state. The patient, Francois Maurice Marcien de Simorre, an old officer, had contracted, in the campaigns of Corsica, a gouty rheumatism, which took from him successively the use of his fingers, his hands, and his feet, and which, at length, deprived him of all motion, even of that of the lower jaw, and caused him also to lose his sight. He spent many years in an armed-chair, without obtaining a moment's sleep, notwithstanding the strongest doses of opium. Reduced to a state wherein he could only suck a little broth or wine, through the very small interval left between the upper and lower teeth, he had two incisive teeth pulled out; and by the opening which he procured by this operation, he could speak more freely, and could imbibe liquids with a pipe, and even swallow a little hashed meat. His body, a sort of animated statue, formed only one piece; all his bones were soldered to one another; and notwithstanding this extreme pain, the conversation of Simorre was often very gay, and he dictated, every year, an almanack in verse, which was eagerly bought up to relieve his misery, without hurting his delicacy.

The skeleton of this person, a monument at once frightful and valuable, of the human figure, is now in the Conservatory at the School of Medicine of Paris. It is well known, that the late Mr. Hunter had in his museum (now the property of the Royal College of Surgeons, in London), a skeleton remarkable for the same peculiarity. The history of this latter case, however, is not at all known; the skeleton having been raised accidentally, by a grave-digger, in a country church-yard.

A'NCON, (*αγκων*; from *αγκαζομαι*, to *embrace*; *απο τȣ αγκεισθαι ετερω οςεω το οςεον*; because the bones meeting, and there uniting, are folded one into another); a name for the elbow.

ANCO'NEUS, (from *αγκων*, the elbow); the *anconeus minor* of Winslow, and *anconeus vel cubitalis riolani* of Douglas, a small triangular muscle situated on the back part of the elbow. It arises from the ridge and from the external condyle of the humerus, by a thick, strong, and short

tendon: from this it becomes fleshy, and after running about three inches obliquely backwards, it is inserted, by its oblique fleshy fibres, into the back part or ridge of the ulna. Its use is to extend the fore-arm.

ANCONEUS EXTERNUS. See TRICEPS EXTENSOR CUBITI.

ANCONEUS INTERNUS. See TRICEPS EXTENSOR CUBITI.

ANCONEUS MAJOR. See TRICEPS EXTENSOR CUBITI.

ANCONEUS MINOR. See ANCONEUS.

ANCONOID PROCESS, *(processus anconoideus;* from *αγκων*, the *elbow);* a process of the cubit. See ULNA.

ANCYLOBLEPHARON, (from *αγκυλος*, *bent*, and *βλεφαρον*, *an eye-lid)*, a disease of the eye, in which the eye-lids are suffered to grow together or to the parts with which they are in contact during the existence of an ophthalmia. Vogel defines it to be the gluing together of the upper and under eye-lid, considering it as a disease *per se.*

Sauvages says, " it is an adhesion of the superior with the inferior eye-lid; whence the eye-lids wink, and the rays of light are either totally or partially intercepted. This disorder derives its origin from glutinous discharges, such as attend most ophthalmies, chiefly in ulcerated eye-lids, and is cured by warm milk, and absorbent powders, commonly tutty: or else the coalition is a perfect concretion of the palpebræ with each other or often with the eye."

In these cases sometimes there, however, remains a small aperture, which is generally in the great angle of the eye: if there should not be any, a perforation must be made in either angle, a probe with a groove then introduced, and with a fine-edged knife the parts must be separated. This done, we must see if the eye-lids adhere to the globe. If that should be the case, they must be carefully divided from each other, in the operation being more sparing of the eye-lid than of the sclerotica. If the adhesion is only to the conjunctiva, blindness is not the consequence; but if on the cornea, the sight is inevitably lost. A re-union is better prevented by injection, than by lint, placed between the eye-lid and ball of the eye, after dipping in a mild liniment; and still more than by a *plate of lead*, as recommended by Sauvages.

Mr. Benjamin Bell says, when the adhesion of the eye-lids is slight, and has not been of long duration, it may be separated by the end of a blunt probe insinuated behind it, so as to tear it asunder; but when they adhere firmly, or to the eye-ball, he advises slow dissection of every adhering fibre, and then the eye only to be covered with a piece of soft lint spread over with Goulard's cerate, or any other cooling emollient ointment; and after the first dressing, a small portion of the same daily insinuated between the eye-lids.

ANCYLOGLOSSUM, (from *αγκυλος*, *crooked*, and *γλωσσα*, *the tongue);* a contraction of the ligaments of the tongue: tongue-tied. Vogel defines it to be *an adhesion of the tongue to the adjacent parts*, so as to hinder sucking, swallowing, and speaking.

Some have this imperfection from the birth, others from disease. In the first case, the membrane which supports the tongue is too short or too rigid; in the latter, an ulcer under the tongue, healing and forming a cicatrix, is sometimes the cause: these speak with some difficulty, and are called by the Greeks *μογιλαλοι*, or *lispers.*

This defect is often imagined in infants when it really does not exist. Some by nature are late before they speak, but when they begin they soon speak properly; these, however, ignorant and officious nurses call *tongue-tied.* Sometimes there is a small membranous production, which extends from the frænum to the tip of the tongue, that they suppose hinders the child from sucking, &c. and it is the cruel practice of some to tear this membrane with their nails. Hence, ulcers are sometimes formed, which are difficult of cure. When the fact is well ascertained, it is only required to set the tongue sufficiently at liberty by a snip with scissars, being careful not to extend the points of the scissars too far towards the frænum. When a child's tongue is tied, it is observed not to suck very freely, it loses its hold of the nipple very frequently, and whilst sucking, it makes a chucking kind of a noise. The instances, however, very rarely occur which require any kind of assistance; for if the child can thrust the tip of its tongue to the outer edge of its lip, or even beyond the gums, this defect does not exist: nay, if the tongue be not greatly restrained, the frænum will stretch gradually by the child's sucking and crying. Besides, without an absolute necessity for it, an operation should not be admitted; for without great circumspection, by cutting the frænum, the nerves passing there may be also cut, and then a loss of speech is the consequence.

Sometimes the tongue is bound down with a fleshy substance; when that is the case, it should never be rashly cut through, because a dangerous hæmorrhage would follow, without any attending advantage: all that is advisable in this circumstance, is to direct the nurse, now and then, to stretch it gently by a light pressure on it with her finger's end. When, in consequence of delivering a child by the feet, a swelling is observed under the tongue, the nurse should be forbidden the use

of any means, for the complaint will soon subside of itself.

Hildanus (Cent. iii. Obs. 28.) gives an accurate account of the nature, cure, and bad effects that may follow on improper methods being used for the cure in these cases. He advises the division of no more of the frænum than appears ligamentous, and then orders it to be gently rubbed, two or three times a day, with honey of roses.

ANCYLOSIS, (from the Greek αγκυλωσις; from αγκυλος, *crooked*), i. e. *anchylosis;* a union of the joints preventing their motion. See ANCHYLOSIS.

ANEMO'NE HEPATICA; the systematic name for the *hepatica nobilis* of the pharmacopœias. See HEPATICA NOBILIS.

ANEMO'NE, MEADOW. See PULSATILLA NIGRICANS.

ANEMONE NEMOROSA; the systematic name of the *ranunculus albus* of the pharmacopœias. See RANUNCULUS.

ANEMONE PRATENSIS; the systematic name for the *pulsatilla nigricans* of the pharmacopœias. See PULSATILLA.

ANETHUM, (ανηθον; from ανευ, afar, and θεω, to run; so called because its roots run out a great way); common dill; the *anethum graveolens* Linn. *Anethum, fructibus compressis.* Class, *Pentandria.* Order, *Monogynia.* This plant is a native of Spain, but cultivated in several parts of England. The seeds of dill are directed for use by the London and Edinburgh Pharmacopœias: they have a moderately warm, pungent taste, and an aromatic, but sickly smell. An essential oil, and a distilled water, are prepared from them, which are given in flatulent cholics and dyspepsia.

ANETHUM FŒNICULUM; the systematic name for the *fœniculum dulce* of the shops. See FŒNICULUM.

ANEURISM, (*aneurisma*, ανευρυσμα; from ανευρυνω, *to stretch* or *dilate*); a genus of disease ranked by Cullen in the class *locales*, and order *tumores.* There are three species of aneurism: 1. The *true aneurism, aneurisma verum*, which answers to the above definition, and is known by the presence of a pulsating tumour. 2. The *spurious aneurism, aneurisma spurium*, which is a collection of blood in the cellular membrane from a ruptured artery. 3. The *varicose aneurism, aneurisma varicosum:* this was first described by Dr. William Hunter.

The term aneurism was originally meant to signify a tumor formed by the dilatation of the coats of an artery; but by modern practitioners made to apply not only to tumors of this kind, but also to such as are formed by blood effused from arteries into the contiguous parts.

1. The *true* or ENCYSTED ANEURISM, when situated near the furface of the body, produces a tumor at first small and circumscribed; the skin retains its natural appearance; when pressed by the fingers, a pulsation is evidently distinguished; and with very little force the contents of the swelling may be made to disappear; but they immediately return upon removing the pressure. By degrees the swelling increases, and becomes more prominent; but still the patient does not complain of pain: on pressure the tumor continues of an equal softness, and is compressible. After this the swelling becomes large, the skin turns paler than usual, and in more advanced stages, œdematous: the pulse still continues; but parts of the tumor become firm from the coagulation of the contained blood, and yield little to pressure; at last the swelling increases in a gradual manner, and is attended with a great degree of pain. The skin turns livid, and has a gangrenous appearance. An oozing of bloody serum occurs from the integuments; and, if a real mortification do not take place, the skin cracks in different parts; and the artery being now deprived of the usual resistance, the blood bursts out with such force as to occasion the almost immediate death of the patient. Thus the disease terminates in the large cavities of the body; but in the extremities we can, by means of the tourniquet, prevent the sudden termination of the disease.

When affections of this kind happen in the larger arteries, the effects produced upon the neighbouring parts are often surprising: the soft parts not only yield to a great extent, but even the bones frequently undergo a great degree of derangement.

2. The *false* or DIFFUSED ANEURISM consists in a wound or rupture in an artery, producing, by the blood thrown out of it, a swelling in the contiguous parts. It is most frequently produced by a wound made directly into the artery.

The following is the usual progress of the disorder. A tumor, about the size of a horse-bean, generally rises at the orifice in the artery soon after the discharge of the blood has been stopped by compression. At first it is soft, has a strong degree of pulsation, and yields a little to pressure, but cannot be made entirely to disappear; for here the blood forming the tumor being at rest, begins to coagulate. If not improperly treated by much pressure, it generally remains nearly of the same size for several weeks. The enlargement however proceeds more rapidly in some cases than in others. Instances have occurred of the blood being diffused over the whole arm in the space of a few hours; while, on the contrary, swellings of this kind have been many months, nay even years, in arriving at any considerable size.

As the tumor becomes larger, it does not, like the true aneurism, grow much more prominent, but rather spreads and diffuses itself into the surrounding parts. By degrees it acquires a firm consistence; and the pulsation, which was at first considerable, gradually diminishes, till it is sometimes

scarcely perceptible. If the blood at first thrown out proceed from an artery deeply seated, the skin preserves its natural appearance till the disorder is far advanced: but when the blood gets at first into contact with the skin, the parts become instantly livid, indicating the approach of mortification; and a real spacelus has sometimes been induced. The tumor at first produces little uneasiness: but as it increases in size, the patient complains of severe pain, stiffness, numbness, and immobility of the whole joint; and these symptoms continuing to augment, if the artery be large, and assistance not given, the teguments at last burst, and death must ensue.

3. The VARICOSE ANEURISM.—When an artery is punctured through a vein, as in blood-letting at the arm, the blood generally rushes into the yielding cellular substance, and there spreads so as to shut the sides of the vein together. But in some instances where the artery happens to be in contact with the vein, the communication opened has been preserved; and the vein not being sufficiently strong for resisting the impulse of the artery, must consequently be dilated. This, which constitutes the *varicose aneurism*, was first accurately described by Dr. Hunter, and since that time it has been frequently observed by different practitioners. Here the swelling is entirely confined to the veins. Soon after the injury the vein immediately communicating with the artery begins to swell, and enlarge gradually. If there be any considerable communications in the neighbourhood, the veins which form them are also enlarged. The tumor disappears upon pressure, the blood contained in it being pushed forwards in its course towards the heart; and when the tumor is large, there is a singular tremulous motion, attended with a perpetual hissing noise, as if air was passing into it through a small aperture.

If a ligature be applied upon the limb, immediately below the swelling, tight enough to stop the pulse in the under part of the member, the swelling disappears by pressure, but returns immediately upon the pressure being removed. If after the swelling is removed by pressure, the finger be placed upon the orifice in the artery, the veins remain perfectly flacid till the pressure is taken off. If the trunk of the artery be compressed above the orifice so as effectually to stop the circulation, the tremulous motion and hissing immediately cease; and if the veins be now emptied by pressure, they remain so till the compression upon the artery be removed. If the vein be compressed a little above as well as below the tumor, all the blood may generally, though not always, be pushed through the orifice into the artery; from whence it immediately returns on the pressure being discontinued.

When the disease has continued long, and the dilation of the veins has become considerable, the trunk of the artery above the orifice generally becomes greatly enlarged, while that below becomes proportionably small; of consequence the pulse in the under part of the member is always more feeble than in the sound limb of the opposite side.

The *cause producing aneurism*, in general, is a natural disease of the arteries. Thus a partial debility of their coats may readily produce the disease; or aneurisms may arise, especially in the internal parts of the body, from great bodily exertions. They are likewise produced by wounds of the coats of the arteries, as now and then happens in the cases just mentioned; or from acrid matter contained in a neighbouring sore; or from the destruction of surrounding parts, by which the natural support is removed.

Not unfrequently, dissection shews an actual and manifest disease of the arterial system, the whole of which is thickened and brittle, and its cellular substance loose and spongy, with spots of ossification besetting the great arterial trunks, giving them the appearance of the knobbed crooked branches of an exhausted tree. This predisposition however, seldom degenerates into aneurism without some degree of direct violence; and on this circumstance Mr. Bell, in his *Principles of Surgery*, lays considerable stress, as it serves to explain the cause of the morbid appearances which attend the complaint. In all parts of the body there are weaknesses and imperfections which we are made sensible of only by the parts being hurt. Aneurisms of the limbs are never known in women; their system is lax, and they are generally exempted from those exertions by which the arteries are often injured or burst. Aneurism is rare in young men, and frequent in the middle stage of life, when the arteries become harder, when the muscular strength is unabated, and the occasional exertions of the limbs very violent. Aneurism is almost peculiar to men in the lower ranks of life, to soldiers, porters, labourers, miners, and those who work at laborious trades, but particularly coachmen and postillions; and there are few of those enlargements of the artery which cannot be distinctly traced to some external injury, some blow, sprain, fall, or violent exertion of the limb. Hence we may fairly infer, that even where no very decided disease of the arteries is present, a violent muscular exertion, unconnected with any external wound, may burst the muscular coat of the artery and produce aneurism, the growth of which (confined as it is by the strong cellular sheath which encloses and strengthens the vessel) is often so slow and gradual as to have the appearance of spontaneous disease.

Aneurisms have frequently been mistaken for abscesses and other collections of matter, and have been laid open by incision; on which account great attention is sometimes required to make the proper distinction. In the commencement of the disease, the pulsation in the tumor is commonly so strong and other concomitant circumstances so evidently point out the nature of the disorder, that

little or no doubt respecting it can ever take place; but in the more advanced stages of the disease, when the swelling has become large and has lost its pulsation, nothing but a minute attention to the previous history of the case can enable the practitioner to form a judgment of its nature.

Aneurisms may be confounded with soft encysted tumors, scrophulous swellings, and abscesses situated so near to an artery as to be affected by its pulsation. But one symptom, when connected with strong pulsation, may always lead to a certain determination that the swelling is of the aneurismal kind, viz. the contents of the tumor being made easily to disappear upon pressure, and their returning on the compression being removed. The want of this circumstance, however, ought not to convince us that it is not of that nature; for it frequently happens, especially in the advanced stages of aneurisms, that their contents become so firm that no effect is produced upon them by pressure. Hence the propriety, in doubtful cases, of proceeding as if the disease was clearly of the aneurismal kind.

Several cases are given by Mr. Bell in illustration of the slow growth of aneurism after an actual giving way of the artery; and the practical inference which he deduces, is the importance of attending to the consequences of obscure sprains and internal injuries of the limbs, particularly the lower extremity, when succeeded by deep-seated tumors, before the muscles, bone, and adjacent cellular substance are brought to that dreadfully diseased state which attends extensive extravasation from a ruptured artery.

Relative to the complication of caries of the bone, combined with, and depending on, aneurism of the contiguous artery, the following case, communicated by Dr. Jeffry, anatomical professor at Glasgow, is added:—A woman was ridden over in the streets, her arm broken in two places, and the bone much shattered. It remained absolutely neglected for six weeks, at which time it was examined, and found to be much swelled by a tumor reaching from the top of the shoulder to the arm, and pulsating in its upper part. It was opened in this spot, and pure blood flowed out; the wound however healed up, but the patient, after being apparently much neglected for five months, died. On dissection, which was eight months after the first accident, the arm was filled with a profusion of mixed and putrid blood, only two inches of the lower part of the bone retained its natural form, all the middle part of the bone was destroyed, and the head only remained on the upper part of the tumor, but with its cancelli quite eroded, nothing being left but the mere shell. Through the whole length of the bone the cancelli were dissolved, and many pieces of the bone were found in the heart of the tumor, exhibiting a most perfect specimen of caries produced by the presence of the extravasated blood which prevented the union of the callus; however, in the midst of this destruction, the periosteum had retained its life, and had made vast efforts at ossification, so as to form, in the length of the tumor, a large flat bone (not a remnant of the humerus, but a fresh production) of a fourth of an inch in thickness, three inches and a half broad, and six inches long, and in appearance not unlike the parietal bone of the skull. Beside this larger piece, the whole sac was full of specks of ossification within the centre of the membranes. The inosculating arteries had also performed their office, and had enlarged to a sufficient size to maintain the circulation.

With regard to the *prognosis*, in cases of aneurism, three circumstances are chiefly to be attended to; the manner in which the disease appears to have been produced, the part of the body in which the swelling is situated, and the age and habit of body of the patient.

If an aneurism has come forward in a gradual manner, without any apparent injury done to the part, and not succeeding any violent bodily exertion, there will be reason to suppose that the disease depends upon a general affection either of the trunk in which it occurs, or of the whole arterial system. In such cases art can give little assistance: whereas if the tumor has succeeded an external accident, an operation may be attended with success.

In the *varicose aneurism* a more favourable prognosis may generally be given than in either of the other two species. It does not proceed so rapidly; when it has arrived at a certain length, it does not afterwards acquire much additional size; and it may be sustained without much inconvenience for a great number of years. As long as there is reason to expect this, the hazard which almost always attends the operation ought to be avoided.

In the second volume of the London Medical Observations, two cases are related by Dr. Hunter, of the varicose aneurism. One of them at that time was of fourteen years standing, and the other had subsisted for five years, without there being any necessity for an operation. And in vol. iii. of the same work, a similar case of five years' duration is related by Dr. Cleghorn.

In a letter, afterwards, from Dr. Hunter, to Mr. Benjamin Bell, the doctor says, "the lady in whom I first observed the varicose aneurism is now living in Bath, in good health, and the arm is in no sense worse, although it is now thirty-five years since she received the injury:" and the doctor farther observes, that he never heard of the operation being performed for the varicose aneurism when known to be such.

Mr. Bell says, he was informed by Dr. William Cleghorn, of Dublin, that the case of varicose aneurism, related in the third volume of the London

Medical Observations, remained nearly in the same state as at the time that account was made out, which included a period of at least twenty years; only that the veins were rather more enlarged. The patient recovered, and the limb became nearly as strong and serviceable as the other. Mr. Pott also met with three different instances of this species of aneurism; and observes, that the operation never became necessary in any of them.

Among other instances of varicose aneurism which have appeared here, a young man from Paisley was examined, several years ago, by different surgeons of this place. The disease was very clearly marked, and no operation was advised. He was afterwards found serving in the navy, where he underwent great fatigue without any inconvenience from the aneurism, though then of thirteen years' standing.

But though this aneurism, when it has arrived at a certain size, commonly remains stationary, and may be borne without much inconvenience for a long time, this is not always the case; for some instances have occurred where the disease was attended with great uneasiness, and where the operation was performed with much difficulty.

In judging further of the probable event of aneurisms in general, the situation of the tumor next requires attention. When it is so situated that no ligature or effectual compression can be applied for stopping the circulation in the part, if the artery be large, there would be the greatest danger in opening it. In this case, therefore, the most fatal consequences are to be apprehended.

When aneurisms are situated near the upper parts of the extremities, surgeons have heretofore been doubtful whether, after tying up the humeral or femoral arteries, the lower parts of the limb would be supplied with blood; and though several successful instances of performing that operation have been published, the success has been pretty generally ascribed to unusual branching of the great arteries of those patients, on whom the operation was performed, above the aneurism. Mr. John Bell, however, in his late very ingenious and important *Discourses on Wounds*, has proved to our satisfaction at least, that the inosculations which take place between the internal iliac and the arteries of the leg, by means of the glutæal arteries and the profunda femoris, are in every case sufficient to supply nourishment to the limb, that the same is the case in the arm; and that therefore in every aneurism, even of the humeral or femoral artery, we ought to perform the operation. Several instances of success are there related; among others, an operation performed by Mr. J. Bell himself, which, as it is, perhaps, the greatest that has hitherto been performed, we shall here abridge for the gratification of our readers.—A leech-catcher fell as he was stepping out of a boat; and a pair of long pointed scissars pierced his hip, exactly over the sciatic notch, where the great iliac artery comes out from the pelvis. The artery bled furiously: the patient fainted. The surgeon easily stopped up the wound, as it was very narrow and deep, and healed it. A great tumor soon formed. The man travelled from the north country, in six weeks, to the Edinburgh infirmary, with a prodigious tumor of the hip, the thigh rigidly contracted, the ham bent, the whole leg shrunk and cold and useless. There was no pulsation nor retrocession of blood on pressure; but the distention was attended with great pain, and the man was extremely anxious to have an operation performed. Though there was little doubt of its being aneurism, it might be a great abscess. It was resolved, therefore, to make a small incision, and just touch the bag with the point of a lancet, and if it contained blood, a full consultation was to be called. Mr. Bell, accordingly, made an incision two inches and a half in length; the great fascia formed the coat of the tumor, and under it were seen the fibres of the great glutæus muscle. As soon as it was opened at one point, great clots of blood came out; and Mr. Bell, after being certain that is was an aneurism of the great artery of the thigh, closed up the wound with a tent-like compress, put the patient to bed, and a pupil held his hand on the hip. This was done at one o'clock; at four the consultation met, and the operation was performed. On making an incision eight inches long, the blood was thrown out with a whishing noise, and with such impetuosity, that the assistants were covered with it. In a moment twenty hands were about the tumor, and the bag was filled with sponges and cloths of all kinds, the blood, however, still made its way; and the man, who had supported himself on his elbow, fell down; his arms and head hung down, he uttered two or three heavy groans, and they thought him dead. At that critical moment Mr. Bell ran the bistoury upwards and downwards; and at once made the wound two feet long; thrust his hand to the bottom of the tumor, felt the warm jet of blood, put his finger on the mouth of the artery, the pulse of which he felt distinctly; which first assured him that the man was alive. The artery was then tied, and when Mr. Bell lifted up his finger, it was discovered to be the posterior iliac; that it had been cut fairly across, and had bled with open mouth. The patient was so low that after dressing the wound, they were obliged to bring in a bed, and leave him to sleep in the operation-room. He was cured of this great wound in less than seven months, and afterwards recovered the use of his leg completely.

In every case of aneurism, the use of *pressure* has been indiscriminately recommended, not only in the incipient period of the disease, but even in its more advanced stages.

In the *diffused* or *false aneurism*, as pressure cannot be applied to the artery alone, without at the same time affecting the refluent veins; and as this, by producing an increased resistance to the arterial pulsations, must force an additional quantity of blood to the orifice in the artery; no advantage is to be expected from it, though it may be productive of mischief.

In the early stages of *encysted aneurism*, while the blood can be yet pressed entirely out of the sac into the artery, it often happens, by the use of soft and somewhat elastic materials, properly fitted to the part, that much may be done in preventing the swelling from receiving any degree of increase; and, on some occasions, by the continued support thus given to the weakened artery, complete cures have been at last obtained. In all such cases, therefore, particularly in every instance of the varicose aneurism, much advantage may be expected from moderate pressure.

But pressure, even in encysted aneurism, ought never to be carried to any great length; for tight bandages, by producing an immoderate degree of reaction in the containing parts to which they are applied, instead of answering the purpose for which they were intended, have evidently the contrary effect. Indeed, the greatest length to which pressure in such cases ought to go, should be to serve as an easy support to the parts affected, and no farther.

A most important question occurs in the *treatment of aneurism*, namely, whether *amputation of the limb* affords the patient any considerable chance for life. The ill success of this dreadful remedy has long made surgeons hesitate on its eligibility, even before the modern operation of tying the artery high up in its course was thought of. The authority of Guattani, and many others, is strongly against amputation. He supposes an *inflamed state* of an aneurismal limb to exist, and to be an objection to amputation, from the great risk of gangrene; in the same manner as the inflammation, succeeding to violent external injury, also forbids amputation. In the latter case, the inflamed state is produced by the extensive injury inflicted by extraneous violence; in the former, a similar state is occasioned by the generally increased action of the inosculating arteries, on which the whole force of the circulation is thrown when the principal trunk is ruptured, and obstructed by the pressure of extensive extravasation, and in both the danger of gangrene from *active* inflammation is most imminent.

In performing the operation for aneurism, by *taking up the vessel*, and laying open the sac, a method preferred by many to amputation, the first step ought to be to obtain a full command of the circulation in the inferior part of the member, by means of the tourniquet. This being done, the patient should be so placed, that the diseased limb, on being stretched on a table, is found to be of a proper height for the surgeon; who, as the operation is generally tedious, ought to be seated. The limb being properly secured by an assistant, the operator is now, with the common scalpel, to make an incision through the skin and cellular substance along the whole course of the tumor; and, as freedom in the remaining parts of the operation is here a matter of much importance, it is even of use to carry this external incision half an inch or so both above and below the farthest extremities of the swelling.

All the effused blood ought then to be wiped off by means of a sponge; and the softest part of the tumour being discovered, an opening ought thereto be made into it with a lancet, large enough for admitting a finger of the operator's left hand. This being done, and the finger introduced into the cavity of the tumor, it is now to be laid open from one extremity to the other, by running a blunt-pointed bistoury along the finger from below upwards, and afterwards from above downwards, so as to lay the whole cavity fairly open.

The cavity of the tumor being thus laid freely open, all the coagulated blood is to be taken out by the fingers of the operator, together with a number of tough membranous filaments commonly found there. The cavity of the tumor is now to be rendered quite dry, and free from the blood which, on the first opening of the swelling, is discharged into it from the veins in the inferior part of the member: the tourniquet is then to be slackened, to discover, not only the artery itself, but the opening into it, from whence the blood collected in the tumor has been all along discharged. This being done, the next point to be determined is the manner of *securing this opening* into the artery, so as to prevent in future any farther effusion of blood. Various means have been proposed for accomplishing this; but the design of all of them may be comprehended under the three following heads:

(1.) The effects of ligature upon a large artery having on some occasions proved fatal to the inferior part of the member, it was at first proposed, that, so soon as the opening into the artery could be discovered, instead of applying a ligature round it, with a fixed design to obliterate its cavity entirely, a piece of agaric, vitriol, alum, or other very astringent substance, should be applied to the orifice, in order, if possible, to produce a reunion of its sides, and thus restore its functions.

(2.) Upon the same principle with the preceding, viz. that of still preserving the circulation of the artery, it was several years ago proposed by an eminent surgeon at Newcastle, Mr. Lambert, that the orifice in the artery should be secured by means of the *twisted suture*. A small needle being

pushed through the edges of the wound, they are then directed to be drawn together by a thread properly twisted round the needle, as is commonly done in treating the hare lip.

Strong objections, however, occur to both of these methods. In the first place, no astringent application with which we are acquainted is possessed of such power as to deserve much confidence. In almost every instance in which they have been used, the hæmorrhage has recurred again and again, so as to prove very distressing, not only to the patient, but to the practitioner in attendance; little or no attention is therefore to be paid to remedies of this kind in ordinary practice.

Mr. Lambert's method of stitching the orifice in the artery is certainly a very ingenious proposal; and would, in all probability, at least in most instances, prove an effectual stop to all farther discharge of blood: but, as we have yet only one instance of its success, little can be said about it. Two material objections, however, seem to occur to this practice. One is, that in the operation for the aneurism, in almost every instance, a very few only excepted, the artery lies at the back part of the tumor; so that, when all the collected blood is removed, there is such a depth of wound, that it must be always a very difficult matter, and on many occasions quite impracticable, to perform this nice operation upon the artery with that attention and exactness which, in order to insure success, it certainly requires. But there is another very material objection. By introducing a needle through the sides of the orifice, and drawing these together by a ligature, the cavity of the artery must undoubtedly be at that point much diminished. Indeed Mr. Lambert, in his account of the case in which this operation was performed, acknowledges that the diameter of the artery was thereby diminished. Now, the passage of the blood being thus contracted at one point, the impulse upon that particular part must be very considerable; so that the very remedy employed for the cure of one species of aneurism will, in all probability, prove a very powerful agent in inducing another; for the blood, being thus obstructed in its usual course, there will be no small danger incurred, of a dilatation being produced immediately above this preternatural stricture.

(3.) Neither of the methods we have yet been considering being found eligible for securing the orifice in the artery, we shall now proceed to describe *the ordinary manner of performing this operation;* which consists in obliterating the arterial cavity entirely by means of ligatures.

The artery being laid bare, in the manner directed, and all the coagulated blood being carefully removed from the cavity of the tumor, on the tourniquet being now slackened so as to bring the orifice in the artery into view, a small probe curved at the extremity is to be introduced at the opening, in order to raise the artery from the neighbouring parts, so as that the surgeon may be enabled with certainty to pass a ligature round it, without comprehending the contiguous nerves, which in general run very near to the large blood vessels of a limb. By this precaution the nerves may be always avoided; and, by doing so, a great deal of mischief may be prevented, which otherwise might supervene. When the disorder is situated either in the ham, or in the usual part of blood-letting in the arm, bending the joints of the knee or of the elbow, as it relaxes the artery a little, renders this part of the operation more easily effected than when the limbs are kept fully stretched out.

The artery being thus gently separated from the contiguous parts, a firm waxed ligature must be passed round it, about the eighth part of an inch or so above the orifice, and another must in the same manner be introduced at the same distance below it.

The ligatures being both finished in the manner directed, the tourniquet is now to be made quite loose; and if no blood is discharged at the orifice in the artery, we may then rest satisfied that the operation is so far properly completed.

The wound is now to be lightly covered with soft lint, and again with a pledget of any emollient ointment over the whole; and a compress of linen being applied over the dressings, all the bandage in any degree requisite is two or three turns of a roller above, and as many below, the centre of the wound, making it press with no more tightness than is absolutely necessary for retaining the application we have just now mentioned.

The patient being now put into bed, the member should be laid in a relaxed posture upon a pillow, and ought to be so placed as to create the least possible uneasiness from the posture in which it is laid.

As the operation for the aneurism is always tedious, and produces much pain and irritation, a full dose of laudanum should be given immediately on the patient being put into bed. In order to diminish sensibility during some of the more capital operations, different trials have been made of opiates given an hour or so before the operation. On some occasions this proved evidently very useful; but in others it seemed to have the contrary effect, particularly in weak, nervous constitutions. Some patients, with any doses, however small, appeared to be rendered more irritable and more susceptible of pain, than if no opiate had been given. Immediately after this operation, however, an opiate ought to be exhibited, to be repeated occasionally according to the degrees of pain and restlessness.

In some few cases of aneurism, it has happened

that the pulse in the under part of the limb has been discovered immediately after the operation. This, however, is a very rare occurrence; for, as this disorder is seldom met with in any other part than at the joint of the elbow, as a consequence of blood-letting, and as it rarely happens that the brachial artery divides till it passes an inch or two below that place, the trunk of this artery is therefore most frequently wounded; and when, accordingly, the ligature, in this operation, is made to obliterate the passage of almost the whole blood which went to the under part of the arm, there cannot be the least reason to expect any pulsation at the wrist, till in a gradual manner the anastomosing branches of the artery have become so much enlarged, as to transmit such a quantity of blood to the inferior part of the member as is sufficient for acting as a stimulus to the larger branches of the artery.

Immediately after the operation, the patient complains of an unusual numbness or want of feeling in the whole member; and as it generally, for a few hours, becomes cold, it is therefore right to keep it properly covered with warm soft flannel; and, in order to serve as a gentle stimulus to the parts below, moderate frictions appear to be of use. In the space of ten or twelve hours from the operation, although the numbness still continues, the heat of the parts generally begins to return; and it frequently happens, in the course of a few hours more, that all the inferior part of the member becomes even preternaturally warm.

Immediately after this operation, the want of feeling in the parts is often very great; and, in proportion as the circulation in the under part of the member becomes more considerable, the degree of feeling also augments. If we could suppose the nerves of the parts below to be always included in the ligature of the artery, that numbness which succeeds immediately to the operation might be easily accounted for; but it has been also known to happen when nothing but the artery was secured by the ligature.

In the mean time, the patient being properly attended to as to regimen, by giving him cordials and nourishing diet when low and reduced, or confining him to a low diet if his constitution is plethoric, the limb being still kept in an easy relaxed posture, towards the end of the fourth or fifth day, sometimes much sooner, a very weak feeble pulse is discovered, in the under part of the member, which becoming stronger in a gradual manner, the patient in the same proportion recovers the use and feeling of the parts.

So soon as there is an appearance of matter having formed freely about the sore, which will seldom happen before the fifth or sixth day, an emollient poultice should be applied over it for a few hours, in order to soften the dressings, which may be then removed. At this time the ligatures might be taken away; but, as their continuance for a day or two longer can do no harm, it is better to allow them to remain till the second or third dressing, when they either drop off themselves, or may be taken away with perfect safety. The dressings, which should always be of the softest materials, being renewed every second or third day, according to the quantity of matter produced, the sore is in general found to heal very easily; and, although the patient may for a considerable time complain of great numbness and want of strength in the whole course of the diseased limb, yet, in most instances, a very free use of it is at last obtained.

(4.) But it happens very often, after the artery seems to be thus secured, that it gives way, and fatal hæmorrhagies ensue; nor is the patient free from this danger for a great length of time. In one of Mr. Hunter's operations, the artery gave way on the 26th day. It was this difficulty of procuring adhesion between the sides of the artery, which may frequently be diseased to some distance above the ligature, that led that ingenious practitioner to propose a method of treatment, which we shall now extract from a paper in the Transactions of a Society for Medical and Chirurgical Improvement, in London, by Mr. Everard Home.

"Mr. Hunter," says he, "finding an *alteration of structure in the coats of the artery previous to its dilatation*, and that the artery immediately above the sac *seldom unites when tied up* in the operation for the aneurism, so that as soon as the ligature comes away, the secondary bleeding destroys the patient, was led to believe, that a previous disease took place in the coats of the artery, in consequence of which it admitted of dilatation capable of producing aneurism. But not satisfied with the experiments on frogs, given by Haller in support of the opinion that weakness alone was sufficient to produce the dilatation, he resolved to try the result in a quadruped, which, from the vessels being very similar in their structure to those of the human subject, would be more likely to ascertain the truth or fallacy of Haller's opinion. That the experiment might have as much as possible the chances most likely to produce aneurism, the carotid artery, as being near the heart, was selected for that purpose."

The proposed experiments having been made on a dog, Mr. Home describes their results as follows:

"The *results of these experiments*," says he, "confirmed Mr. Hunter in his opinion, that *the artery*, in cases of aneurism, is in *a diseased state*; and led him to believe, that the disease often extends along the artery for some way from the sac;

and that the cause of failure in the common operation, arises from tying a diseased artery, which is incapable of union, in the time necessary for the separating of the ligature.

"The femoral and popliteal arteries are portions of the same trunk, presenting themselves on different sides of the thigh, and are readily come at in either situation; but, where the artery is passing from one side to the other, it is more buried in the surrounding parts, and cannot be exposed without some difficulty.

"In performing the *operation for the popliteal aneurism*, especially when the tumor is large, the ligature is commonly applied on the artery at that part where it emerges from the muscles. This mode of performing the operation will be found inadequate, if the disease of the artery extends above the sac; for, if the artery should afterwards give way, there will not be a sufficient length of vessel remaining, to allow of its being again secured in the ham. To follow the artery up through the insertion of the triceps muscle, to get at a portion of it where it is sound, becomes a very disagreeable part of the operation; and, to make an incision upon the fore part of the thigh, to get at and secure the femoral artery, would be breaking new ground; a thing to be avoided, if possible, in all operations.

"Mr. Hunter, from having made these observations, was led to propose, that, in this operation, the artery should be taken up in the anterior part of the thigh, at some distance from the diseased part, so as to diminish the risk of hæmorrhage, and admit of the artery being more readily secured, should any such accident happen. The force of the circulation being thus taken off from the aneurismal sac, the progress of the disease would be stopped; and he thought it probable, that, if the parts were left to themselves, the sac, with its contents, might be absorbed, and the whole of the tumor removed; which would render any opening into the sac unnecessary."

Mr. Bell thinks, the most important point in this operation is to determine whether the artery should be merely *tied*, or whether it should be *cut through* after the ligatures have been applied. The former was the practice of Mr. Hunter, and most of the surgeons who have immediately imitated him; but the frequency of secondary hæmorrhages, from ulceration beneath the ligature, and difficulty of obliterating the artery by simple ligature, rendered several of the most promising operations finally unsuccessful. On the other hand, when the artery is cut through, the state of the parts resembles more closely that of common amputation, in which the safety and practicability of securing even the femoral artery by simple ligature is fully proved. Hence it is that there appears good reason for adopting the method of *dividing the artery before the wound is brought together;* and the experience of Mr. Abernethy, and of several eminent operators, appears in this respect perfectly to coincide. We cannot, however, conclude this subject, without directing the reader's attention to one circumstance consequent upon the division of the artery, which is, the danger of the ligature slipping off the divided end of the vessel, through the powerful retraction which speedily takes place, and which involves the hazard of almost instant death, from the copious hæmorrhage through the newly opened vessel. For this there appears to be two remedies; the one, to include within the ligature a certain portion of the cellular membrane along with the artery; the other, the simple, but apparently effectual, contrivance proposed by Mr. Cline, jun. of transfixing the artery with a needle, and passing, by its assistance, through the substance of the vessel, the same ligature which has already stopped the flow of blood by its compression. See Arteries, and Plate III.

Mr. Bell describes, among the *anomalous species* of aneurism, "that *by anastomosis*." This is an aneurismal tumor formed and fed by, not a single artery, but a great variety of vessels, all of which communicate freely with each other, and also pour their contents into the tumor, and give it a most vigorous pulsation. If one of these tumors be opened, the hæmorrhage is prodigious, and the number of vessels which supply it is so great, as to render all attempts at securing them individually by ligature abortive. A curious case of this species of aneurism, is, that of a young woman who has a tumor within the pelvis, lying between the rectum and vagina, principally inclining towards the left side, so that on introducing one finger within the rectum, and the other within the vagina, the pulsation may be felt between them. It has subsisted for some years, during which she has had two children. The lower hæmorrhoidal, and the pudic arteries, appear to have the greatest share in producing this aneurismal tumor, and, by their increased activity, the inosculations between them are so much enlarged, that pretty large arteries may be felt running a tortuous course along the walls of the rectum and vagina.

The cure of this species of aneurism, when seated on the forehead, or in accessible parts, is not, as we are told, "to cut *into* it, but to cut *it out*." As it is a mere congeries of active vessels, small in dimensions, and almost innumerable in quantity, the interruption of particular vessels will not reduce the tumor; and, above all things, this variety of disease should be treated in its earliest stage, when alone it easily admits of radical cure.

ANEURISMA SPURIUM. See Aneurism.

ANEURISMA VARICOSUM. See Aneurism.

ANEURISMA VERUM. See ANEURISM.

ANGEIO'LOGY, or ANGIOLOGY, (αγγειολογια, from αγγειον, a *vessel*, and λογος, a *discourse)*; the doctrine of the vascular system of the human body.

ANGEIO'TOMY, (αγγειοτωμια, from αγγειον, a *vessel*, and τεμνω, *to cut)*; the dissection of the blood-vessels of an animal body; also the opening of a vein or an artery singly.

ANGE'LICA, (so called from its supposed *angelic* virtues). The sort best known is garden angelica; *angelica archangelica* Linn. *angelica foliorum impari lobato.* Class, *Pentandria.* Order, *Digynia.*

This plant is a native of Lapland, but cultivated in our gardens. There are five species. 1. The *sativa*, or common angelica, which is cultivated in gardens for medicinal use, and likewise for a sweetmeat, grows naturally in the northern countries. The root of this species is brown, oblong, and an inch or two thick, fragrant, and acrid. The leaves are very large, composed of pinnated foliola, of an oblong oval figure, dentated at the edge, and the odd leaf at the end of the pinna lobated; the stalk is round, striated, and as thick as a child's arm. The umbels are very large, and of a globose figure; the flowers very small, and greenish. 2. The *arch-angelica*, is a native of Hungary and Germany. The leaves are much larger than those of the former, and the flowers are yellow. 3. The *sylvestris* grows naturally in moist meadows, and by the sides of rivers, in many parts of Britain; so is seldom admitted into gardens. 4. The *atro-purpurea canadensis.* 5. The *lucida canadensis.* These are natives of North America, but have neither beauty nor use.

The common angelica prefers a moist soil. The seeds should be sown soon after they are ripe. When the plants come up about six inches high, they should be transplanted very wide, as their leaves spread greatly. If they are planted on the sides of ditches or pools of water, about three feet distance, they will thrive exceedingly.

For the purposes of medicine, Bohemia and Spain produce the best kinds of angelica. The London College direct the roots brought from Spain to be alone made use of. Angelica roots are apt to grow mouldy, and be preyed upon by insects, unless thoroughly dried, kept in a dry place, and frequently aired. Perhaps the roots which are subject to this inconvenience, might be preserved by dipping them in spirit of wine.

All the parts of angelica, especially the root, have a fragrant aromatic smell, and a pleasant bitterish warm taste, glowing upon the lips and palate for a long time after they have been chewed. The flavour of the seeds and leaves is very perishable, particularly that of the latter, which, on being barely dried, lose the greatest part of their taste and smell: the roots are more tenaceous of their flavour, though even these lose part of it upon keeping. The fresh root, wounded early in the spring, yields an odorous, yellow juice, which, slowly exsiccated, proves an elegant gummy resin, very rich in the virtues of the angelica. On drying the root, this juice concretes into distinct moleculæ, which, on cutting it longitudinally, appear distributed in little veins: in this state, they are extracted by pure spirit, but not by watery liquors.

Angelica is one of the most elegant aromatics of European growth, though little regarded in the present practice. The root, which is the most efficacious part, is rarely met with in prescription, and does not enter into any officinal composition.

Dr. Cullen ranks its properties with those of the carminative seeds in general.

ANGELICA ARCHANGELICA; the systematic name for the angelica of the shops. See ANGELICA.

ANGELICA, GARDEN. See ANGELICA.

ANGELICA SATIVA; the same as ANGELICA SYLVESTRIS.

ANGELICA SYLVESTRIS; called also *wild angelica.* See ANGELICA.

ANGELI'NÆ CORTEX. The tree from which this bark is procured is a native of Grenada. It has been recommended as an anthelmintic for children.

ANGI'NA, (from αγχω, to *strangle;* because it is often attended with a sense of strangulation); a sore throat. See CYNANCHE.

ANGINA PECTORIS, an anomalous affection of the chest and organs of respiration, by Dr. Parry, of Bath, placed under the head of SYNCOPE, is a disease extremely dangerous in its nature, little understood by physicians, and, by Dr. Heberden's account, not very rare. It seizes the patient when walking, and particularly when he walks soon after eating, with a most disagreeable and painful sensation in the breast, which seems to threaten immediate destruction: but the moment he stands still, all the uneasiness vanishes. In all other respects, the patient, at the beginning of this disorder, is well, and has no shortness of breath. After it has continued some months, the fits will not cease instantaneously on standing still; and it will come on not only when the patient is walking, but when he is lying down, and will oblige him to rise up out of his bed, every night, perhaps, for many months together. In one or two very inveterate cases, it has been brought on by the motion of a horse, or carriage, and even by swallowing, coughing, going to stool, speaking, or by any disturbance of mind. Dr. Heberden says, the persons whom he knew to be thus affected were all men, and almost all above fifty years of age, most of them with short necks, and

inclining to be fat. Something like it, however, he observed in one woman, who was paralytic, and one or two young men complained of it in a slight degree. Other practitioners, however, have observed it in very young persons.

When a fit of this sort comes on by walking, its duration is very short, as it goes off almost immediately upon stopping. If it comes on in the night, it will last an hour or two. Dr. Heberden met with one in whom it once continued for several days; during all which time the patient seemed to be in imminent danger of death. Most of those attacked with the disease died suddenly: though this rule was not without exceptions; and Dr. Heberden observed one who sunk under a lingering illness of a different nature.

The *os sterni* is usually pointed to as the seat of this malady; but it seems as if it was under the lower part of that bone, and at other times under the middle or upper part, but always inclining more to the left side; and, in many cases, there is joined with it a pain about the middle of the left arm, which appears to be seated in the biceps muscle.

The youngest subject that Dr. Fothergill ever saw afflicted with this disorder was about thirty years of age, and this person was cured. The method that succeeded with him was a course of pills, composed of the mass of gum pill, soap, and native cinnabar; with some chalybeate bitters: this was continued for some months; after which he went to Bath several successive seasons, and acquired his usual health: he was ordered to be very sparing in his diet; to keep the bowels open; and to use moderate exercise on horseback, but not to take long or fatiguing walks.

The only symptom in this patient that is mentioned, was a stricture about the chest, which came on if he was walking up hill, or a little faster than ordinary, or if he was riding a very brisk trot; for moderate exercise of any kind did not affect him; and this uneasy sensation always obliged him to stop, as he felt himself threatened with immediate death, if he had been obliged to go forward.

It is the *sharp constrictive pain across the chest*, that (according to Dr. Fothergill's observation) particularly marks this singular disease; and which is apt to supervene upon a certain degree of muscular motion, or whatever agitates the nervous system.

In such cases as fell under the inspection of Dr. Fothergill, he very seldom met with one that was not attended with an irregular and intermitting pulse; not only during the exacerbations, but often when the patient was free from pain, and at rest: but Dr. Heberden observes, that the pulse is, at least sometimes, not disturbed; and mentions his having once had an opportunity of being convinced of this circumstance, by feeling the pulse during the paroxysm.

As to the nature of this disease, it appears to be purely *spasmodic:* and this opinion will readily present itself to any one who considers the sudden manner of its coming on and going off; the long intervals of perfect ease; the relief afforded by wine, and spirituous cordials; the influence which passionate affections of the mind have over it; the ease which comes from varying the posture of the head and shoulders, or from remaining quite motionless; the number of years for which it will continue, without otherwise disordering health; its bearing so well the motion of a horse or carriage, which circumstance often distinguishes spasmodic pains from those which arise from ulcers; and, lastly, its coming on for the most part after a full meal, and in certain patients at night, just after the first sleep, at which time the incubus, convulsive asthma, and other ills, justly attributed to the disordered functions of the nerves, are peculiarly apt to return, or to be aggravated.

From all these circumstances taken together, there can be little doubt that this affection is of a spasmodic nature: but though it should be admitted, that the whole distress in these cases arises from spasm, it may not be so easy to ascertain the particular muscles which are thus affected.

The violent sense of strangling or choaking, which shews the circulation through the lungs to be interrupted during the height of the paroxysm; and the peculiar constrictive pain under the sternum, always inclining (according to Dr. Heberden's observation) to the left side; together with that most distressing and alarming sensation, which, if it were to increase or continue, threatens an immediate extinction of life, might authorise us to conclude that the heart itself is the muscle affected. The only objection to this idea, and, if it had been constantly observed, it would be insurmountable, is, that the pulse is not always interrupted during the paroxysms. The appearance in two of the dissections, favour the opinion that the spasm affects the heart; as in one subject the left ventricle (and, though it be not mentioned, we may presume the right one also) was found as empty of blood as if it had been washed; and in another, the substance of the heart appeared whitish, not unlike a ligament; as it should seem, in both cases, from the force of the spasm squeezing the blood out from the vessels and cavities.

If this hypothesis be allowed, we must conclude, that the spasm can only take place in an inferior degree, as long as the patient continues to survive the paroxysm; since an affection of this sort, and in this part, of any considerable duration or violence, must inevitably prove fatal: and, accord-

ingly, as far as could be traced, the persons who have been known to labour under this disease have in general died suddenly.

The dissections also shew, that whatever may be the true seat of the spasm, it is not necessary for the bringing of it on, that the heart, or its immediate appendages, should be in a morbid state; for in three out of six cases that have been made public, these parts have been found in a sound state.

On opening the body of a gentleman who died soon after having written his own case, in a letter to Dr. Heberden, "upon the most careful examination, no manifest cause of his death could be discovered; the heart in particular, with its vessels and valves, were all found in a natural condition."

In the case communicated by Dr. Percival to the publishers of the Edinburgh Medical Commentaries, "the heart and aorta descendens were found in a sound state." And in Dr. Haygarth's patient, "on opening the thorax, the lungs, pericardium, and heart, appeared perfectly sound." Not to mention Dr. Fothergill's patient (R. M.) in whose body the only morbid appearance about the heart was a small white spot near the apex. So that the cause, whatever its nature might have been, was at too great a distance, or of too subtile a nature to come under the inspection of the anatomist. But there was a circumstance in two of the subjects that is worthy of remembrance; and which shews that the crasis of the blood, while they are living, must have been greatly injured, namely, its not coagulating, but remaining of a cream-like consistence, without any separation into serum and crassamentum.

From all that we have seen hitherto published, it does not appear that any considerable advances have been made towards the actual cure of this anomalous spasm. Dr. Heberden (to whom the public are highly indebted for first making the disorder known) confesses, that bleeding, vomits, and other evacuations, have not appeared to do any good; wine and cordials, taken at bed-time, will sometimes prevent or weaken the fits; but nothing does this so effectually as opium: in short, the medicines usually called *nervous* or *cordial*, such as relieve and quiet convulsive motions, and invigorate the languishing principle of life, are what he recommends.

Dr. Wall had one patient, out of twelve or thirteen, that he had seen, who applied to him early in the disease, and was relieved considerably by the use of antimonial medicines joined with the fœtid gums: he was still living at the time the doctor wrote his paper (November, 1772), and going about with tolerable ease. Two were carried off by other disorders; all the rest died suddenly.

Dr. Fothergill's directions are chiefly calculated with the view to prevent the disorder from gaining ground, and to alleviate present distress. Accordingly he enjoins such a kind of diet as may be most likely to prevent irritability: in particular, not to eat voraciously: to be particularly abstemious in respect to every thing heating; spices, spirits, wines, and all fermented liquors: to guard most scrupulously against passion, or any vehement emotions; and to make use of all the usual means of establishing and preserving general health: to mitigate excesses of irritability by anodynes; or pains, if they quicken the circulation: to disperse flatulencies when they distend the stomach, by moderate doses of carminatives; amongst which, perhaps, simple peppermint water may be reckoned one of the safest. But since obesity is justly considered as a principal predisposing cause, he insists strongly on the necessity of preventing an increase of fat, by a vegetable diet, and using every other practicable method of augmenting the thinner secretions.

These were the only means, that occurred to the English physicians, of opposing this formidable disease: but Dr. Smith of Ireland has, we are told, discovered that it may certainly be cured by issues, of which Dr. Macbride gives the following instances: when these are tried in any case, they should be placed inter scapulas, and kept open by horse-beans so as to produce a copious discharge.

"*A. B.* a tall well-made man; rather large than otherwise, of healthy parents, except that there had been a little gout in the family; temperate, being very attentive to the business of his trade (that of a watch-maker); led a life uncommon sedentary; had, from his boyhood upwards, been remarkably subject to alarming inflammations of his throat, which seized him at least once in the course of the year; in all other respects well.

"In 1767 (then forty-eight years of age) he was taken, without any evident cause, with a sudden and very dispirited throbbing under the sternum. It soon afterwards increased, and returned upon him every third or fourth week, accompanied with great anxiety, very laborious choaking, a sensation of fulness and distension in the head, a bloated and flushed countenance, turgid and watery eyes, and a very irregular and unequal pulse. The paroxysm invaded, almost constantly, while he was sitting after dinner; now and then he was seized with it in the morning, when walking a little faster than usual; and was then obliged to stop, and rest on any object at hand. Once or twice it came on in bed; but did not oblige him to sit up, as it was then attended with no great difficulty in breathing. In the afternoon fits, his greatest ease was from a supine posture; in which he used to continue motionless for some hours, until, quite spent and worn out with anguish, he dropped into a slumber. In the intervals between these attacks, which at length grew so frequent as to return every

fourth or fifth day, he was, to appearance, in perfect health.

" Thus matters continued for more than two years; and various anti-spasmodics were ineffectually tried for his relief. In 1796, there supervened a very sharp consistory pain at the upper part of the sternum, stretching equally on each side, attended with the former symptoms of anxiety, dyspnœa, choaking, &c. and with an excruciating cramp, as he called it, that could be covered with a crown piece, in each of his arms, between the elbow and the wrist, exactly at the insertion of the pronator teres; the rest of the limb was quite free. The fits were sometimes brought on, and always exasperated, by any agitation of mind or body. He once attempted to ride on horseback during the paroxysm; but the experiment was near proving fatal to him. The difference of season or weather made no impression upon him. Still, in the intervals, his health was perfectly good, except that his eyes, which before his illness were remarkably strong and clear, were now grown extremely tender, and that his sight was much impaired. He had no flatulency of stomach, and his bowels were regular.

" In this situation (February 22, 1770), he applied to me for assistance. I had seen, I believe, eight or ten of these frightful cases before. Two of the patients dropped dead suddenly. They were men between forty and fifty years of age, and of a make somewhat fleshy. The fate of the others I was not informed of; or, at least, cannot now recollect.

" Having found the total inefficacy of blisters, and the whole class of nervous medicines, in the treatment of this anomalous spasm, I thought it right to attempt the correcting or draining off the irritating fluid, in the case now before us. To this purpose I ordered a mixture of lime water with a little of the compound juniper water, and an alterative proportion of Huxham's antimonial wine: I put the patient on a plain, light, perspirable diet, and restrained him from all viscid, flatulent, and acrimonious articles. By pursuing this course, he was soon apparently mended; but after he had persisted regularly in it for at least two months, he kept for some time at a stand. I then ordered a large issue to be opened on each of his thighs. Only one was made. However, as soon as it began to discharge, his amendment manifestly increased. The frequency and severity of the fits abated considerably, and he continued improving gradually, until, at the end of eighteen months, he was restored to perfect health; which he has enjoyed, without the least interruption, till now, except when he has been tempted (perhaps once in a twelvemonth) to transgress rules, by making a large meal on salted meat, or indulging himself in ale or rum punch, each of which never failed to disorder him from the beginning of his illness: and even on these occasions, he has felt no more than the slightest motion of his former sufferings; insomuch that he would despise the attack, if it did not appear to be of the same stock with his old complaint. No other cause has had the least ill effect on him.

" Though rum was constantly hurtful, yet punch, made with a maceration of black currants, in our vulgar corn spirit, is a liquor that agrees remarkably well with him.

" He never took any medicine after the issue began to discharge; and I have directed that it shall be kept open as long as he lives. The inflammations of his throat have disappeared for five years past; he has recovered the strength and clearness of his sight, and his health seems now to be entirely re-established."

Dr. Macbride, in a letter to Dr. Duncan, published in the Edinburgh Medical Commentaries, gives the following additional observations on this disease:

" Within these few weeks I have, at the desire of Dr. Smyth, visited, three or four times, a very ingenious man, who keeps an academy in the city of about thirty-four years of age, who applied to the doctor for his advice in January last.

" I shall give you his symptoms as I had them from his own mouth, which appear to me to mark his case to be an angina pectoris, and as deplorable as any that I have read of. It was strongly distinguished by the exquisite constrictory pain of the sternum, extending to each of his arms as far as the insertion of the deltoid muscle, extreme anxiety, laborious breathing, strangling, and violent palpitation of the heart, with a most irregular pulse. The paroxysms were so frequent, that he scarce ever escaped a day, for six or seven years, without one. They were usually excited by an agitation of mind or body, though slight. He had clear intervals of reason between the fits. The disorder seems hereditary in him, as he says his father was affected in the same manner some years previous to his death. He has a strong gouty taint, which never shewed itself in his limbs; and he has led a life of uncommon sedentariness, from intense application to mathematical studies, attention of mind, and passion, even from his boyish years. These circumstances may, perhaps, account for his having been taken with this disease at so early an age as seventeen.

" A large issue was immediately opened in each of his thighs. In a month afterwards he began to mend, and has gone on improving gradually. He can now run up stairs briskly, as I saw him do no later than yesterday, without hurt; can bear agitation of mind; and has no complaint, excepting a slight oppression of the breast, under the sternum, which he feels sometimes in a morning, immediately after dressing himself, and which he thinks is brought

on by the motion used in putting on his clothes; though for a complete week preceding the day on which I saw him last, he told me that he had been entirely free from all uneasiness, and was exulting that he had not had such an interval of ease for the last seven years.

"Doctor Smyth also shewed me, in his *adversaria*, the case of a gentleman who had been under his care in 1763, which he had forgotten when my book went to the press, and which he was reminded of the other day by a visit from his patient. It was a genuine angina pectoris, brought on by a very sedentary life, and great vexation of mind, clearly marked by the exquisite pain under the sternum, that extended acutely to the upper extremities, particularly along the left arm, together with the other symptoms of dyspnœa, anxiety, palpitation of the heart, &c. recited in the case above. The disorder went off in 1762, by large spontaneous discharges from the piles, but returned upon him severely in 1765. Issues in his thighs were then recommended to him, but not made. But, whether it was by the persuasion of some friend, or of his own accord, he went into a course of James's powder, in small alterative doses, combined with a little castor and assafœtida. This he persisted in for about six weeks; in the mean while he had large acrimonious gleetings from the scrotum, and a plentiful discharge of ichor from the anus. From this time he began to find his complaints grow less and less distressing, and he has now been totally free from them for six years past."

We shall now state the more recent opinions and remarks of Dr. Parry, of Bath, and his inducements for giving this disease another name. He details a number of cases mentioned by other authors, and several of which had fallen under his own notice, and that of his medical friends. From these data he gives the following enumeration of symptoms, which, as being essentially different from Dr. Heberden's description, he thinks entitle it more properly to the name of SYNCOPE ANGINOSA.

"The first symptom," says Dr. Parry, "is an uneasy sensation, which has been variously denominated a stricture, an anxiety, or a pain, extending generally from about the middle of the sternum across the left breast, and, in certain stages of the disorder, usually stretching into the left arm, a little above the elbow. In some few examples, the pain, stricture, or anxiety, is in a certain degree felt also across the right breast; and occasionally, though I believe rarely, has extended itself to one or both wrists.

"The pain occurs in paroxysms, and in the early periods of the disease is seldom produced without some apparent cause, such as walking, particularly up hill or up stairs, against the wind, or in a quick pace. On these occasions the patient feels as if persisting in the exertion would produce a total suspension of the powers of life. He therefore stands still, or turns from the wind; on which the uneasy sensation soon vanishes. We are told of one patient, who appears to have been, in other respects, a man of unusual firmness of mind, that he had the resolution to continue walking, and that he found the pain go off after it had affected him from five to ten minutes. This sensation in the breast often admits of temporary relief from the evacuation of wind by the mouth, and is altogether so free and distinct from any difficulty of breathing, that patients during the paroxysm make a deep inspiration with the utmost ease, and, in some instances, appear to be fond of sighing deeply, and of retaining their breath. In some cases, it is either conjoined with an unequal pulse, or affects persons who are subject to that symptom. In other cases, the pulse has been habitually so little changed, as to lead to the opinion that the heart in no respect primarily suffers. But whatever may be the state of the pulse as to regularity, I believe we shall always find it more or less feeble according to the violence of the paroxysm.

"In the slighter cases, and in this first stage of the disorder, the fit seldom comes on but from the exertions which I have mentioned; and as it is probable that experience of their mischievous effects will cause these exertions to be as much as possible shunned, patients will continue many days, and sometimes weeks, without any attack of the disease. It has been observed, that paroxysms are most apt to occur from walking after a meal. In general, they are not excited by exercise on horseback, or in a carriage, or by some short and partial though strong exertions of the body itself, as in talking, laughing, coughing, or vomiting.—They have been by some thought to occur most frequently in the extremes of hot and cold weather; but in many instances, there has been no perceptible difference in this respect.

"As the disease advances, or in violent cases, the paroxysms sometimes come or are much increased, from certain passions of the mind; from slow walking, from riding on horseback, or in a carriage; from swallowing, speaking, coughing, or straining at stool; and sometimes also they attack the patient from about two to four o'clock in the morning, or while sitting or standing, without any previous exertion or obvious cause. The paroxysms now also become more violent, and do not so readily recede. During the fit, the pulse sinks in a great degree; the face and extremities become pale, and bathed in a cold sweat, and for a while, perhaps, the patient is deprived of the powers of sense and voluntary motion. At length, after the disease has recurred more or less frequently, sometimes during the space of many years, which admit of the patient's death from a variety of other causes,

a more violent attack, of the nature which I have just described, puts a sudden period to his existence.

"These are the essential symptoms and more obvious causes of the unmixed angina pectoris.

"To this we may add, that the angina pectoris is in no stage attended with inflammatory fever, and that both its termination, and the appearances, on dissection, of those who die of it, are totally different from those related in the paper (referred to above) in the London Medical Transactions.

"Equally dissimilar also to the disease which I have described are those three cases of Drs. Macbride and Smith of Dublin, in the fifth volume of the Edinburgh Medical Commentaries. They are evidently cases of palpitation of the heart, such as every physician of extensive practice must have often seen. In almost every violent case of this kind, there is a pain of the chest and elbows, as in the true angina pectoris. Nor is it difficult to understand how a rapid and irregular transmissson of blood through the carotid and pulmonary arteries should produce that laborious respiration, turgescence and redness of the face and eyes, and headach, which are mentioned in the cases referred to. In the true angina pectoris, on the contrary, as we have seen above, there is neither dyspnœa nor palpitation of the heart.

"From the detail which I have given, it appears that there have been published not more than ten essays relative to the true angina pectoris, containing only as many detailed cases, and nine dissections of persons dying of that disorder.

"We cannot wonder that an experience so contracted should have left some symptoms of the disease unnoticed, and much uncertainty with regard to the distinctions and pathology. These deficiencies, I trust, will be in part supplied by the cases which I have related.

"In Mr. Bellamy, the angina pectoris appears to have been much complicated with another disorder, from which its symptoms are scarcely separable; but the two last cases are by far the most simple of any which have been detailed. They had medical assistance the soonest after the commencement of the paroxysm, and proved fatal after the smallest number of attacks. One patient may be almost said to have died twice; so that the circumstances accompanying the fatal termination were capable of being ascertained in the most exact manner.

"He had the common symptom of a pain affecting the sternum, and extending from thence across the lower part of the left mamma, first into the inside of the left elbow, and afterwards of the right elbow. This pain was relieved by eructations. He had no dyspnœa, or palpitation of the heart. —His pulse was weak and small, and had, at long intervals, an occasional imperfect stroke. These symptoms have already been mentioned by authors as generally occurring. The following circumstances I cannot anywhere find described:

"My patient's disorder was increased by bending the trunk of the body forwards; and it was probably from some relief which he experienced that he was fond not only of straightening the spine, with the head somewhat reclined backwards, but also of stretching out his arms in the posture of yawning. He sighed frequently, and seemed to take great pleasure in resting on a full inspiration, which afforded a momentary relief to the uneasy sensation in his breast. Is it possible that this symptom, which is not remarked by any of the writers on the angina pectoris, was wanting in those cases which fell under their notice? I am disposed to think that it was not; because it has been very observable in several examples which I have known of patients labouring under this disease; and my learned friend, Dr. Falconer, with whom I have conversed on this subject, assures me, that it was particularly remarkable in two instances which were some years ago under his care, nearly at the same time, and which ended in sudden death.

"From the preceding observations, I think it evidently appears, that the angina pectoris is a mere case of *syncope* or fainting, differing from the common syncope only in *being preceded by an unusual degree of anxiety or pain in the region of the heart*, and in being *readily excited*, during a state of apparent health, by any general exertion of the muscles, more especially that of walking."

On this principle, Dr. Parry, recommends the insertion of this disease, in Dr. Cullen's Nosological System, under the trivial name of Syncope Anginosa. See SYNCOPE.

ANGIOLOGY, (αγγειολογεια; from αγγειον, *a vessel*, and λογος, a *discourse*); the doctrine of the vessels of the human body; the same as ANGEIOLOGY.

ANGUSTURA; a bark imported from Angustura, in South America. It is thought to be the bark of the *brucea antidysentrica* or *ferruginea.* Willdenow, however, suspects that it is the bark of the *magnolia plumieri.* The first parcel of it came from Dominica in July 1788, with an account, "that it had been found superior to the Peruvian bark in the cure of fevers."

In appearance it is various, owing to its having been taken from larger or smaller branches. Its outer surface is more or less wrinkled, and covered with a greyish coat, below which it is of a yellowish brown: the inner surface is of a dull brown; and it breaks short and resinous. The taste is intensely bitter, and slightly aromatic, leaving a strong sense of heat and pungency in the throat. Its odour is very peculiar. The powder is of a yellow colour.

From the experiments of Mr. Brande, 3840 parts of angustura, yielded to alkohol, 144 of re-

sin, and 300 of an acrid unctuous substance: the residuum yielded to water 1500 of dry gummy extract. Treated first with water, it gave 2110 grains of a clear brown extract, bitter, but not acrid, and afterwards 161 of a resin of a light brown colour, and extremely acrid. By distillation it gave 26 of essential oil. The tincture is of a deep yellow colour, reddens infusion of turnsole, and becomes turbid and white on admixture with water. By repeated filtration a brownish resin is separated, and the transparent fluid has a pale yellow colour. Dr. Andrew Duncan says it is not precipitated by a solution of gelatin, but by infusion of galls. "It therefore," he says, "does not contain *tanin* but *cinchonin*, and it has the peculiar property of acquiring a deep red colour with red sulphate of iron, and depositing a purplish slate-coloured precipitate."

Considered as an aromatic bitter, it has been found to stimulate and give tone to the organs of digestion. It increases the appetite for food, removes flatulence and acidity, arising from dyspepsia, and is a very effectual remedy in diarrhœa, from weakness of the bowels, and in dysentery; besides which, it possesses the singular advantage of not oppressing the stomach, as cinchona is apt to do. It does not cure intermittents, however, as appears from many trials.

This bark is exhibited, 1. In powder, in doses of from 5 to 20 or 30 grains, either alone or with rhubarb, magnesia, or carbonate of lime. 2. In infusion: one drachm in four ounces of water daily. 3. In tincture, with proof spirit. 4. In a watery extract, prepared after the common way.

ANIMAL, (from *anima*, life); an organized and living body, which is also endowed with sensation: thus, minerals are said to grow or increase, plants to grow and live, but animals alone to have sensation.

It is this property of sensation alone that can be deemed the essential characteristic of an animal; and by which the animal and vegetable kingdoms seem to be so essentially separated, that we cannot even imagine the least approximation of the one to the other. Those naturalists, indeed, who have supposed the distinction between animals to consist in any thing else than what we have already mentioned, have found themselves greatly embarrassed; and have generally agreed, that it was extremely difficult, if not impossible, to settle the boundaries between the animal and vegetable kingdoms. But this difficulty will be easily seen to arise from their taking the characteristic marks of the animal kingdom, from something that was evidently common to both. Thus, Boerhaave attempted to distinguish an animal from a vegetable, by the former having a mouth which the latter has not: but here, as the mouth of an animal is only the instrument by which nourishment is conveyed to its body, it is evident, that this can be no essential distinction, because vegetables also require nourishment, and have instruments proper for conveying it into their bodies; and where the end is the same, a difference in the means can never be essential. The fixing the difference in an animal's having a gula, stomach, and intestines, attempted by later writers, is as little to the purpose.

The power of moving from one place to another, has, by many, been thought to constitute their difference; and indeed, in most cases, it is the obvious mark by which we distinguish an animal from a vegetable: but Lord Kaime, gives several very curious instances of the locomotive power of plants; some of which, as he says, would do honour to an animal.—"Upon the slightest touch, the sensitive plant shrinks back and folds up its leaves, similar to a snail; which, on the slightest touch, retires within its shell. The *Dionæa*, a new species of the sensitive plant has been lately discovered. If a fly perch upon one of its flower-leaves, it closes instantly, and crushes the insect to death. There is nothing more admirable than a contrivance, visible in many plants, to take advantage of good weather, and to protect themselves against bad. They open and close their flowers and leaves in different circumstances: some close before sunset, some after: some open to receive rain, some close to avoid it. The petals of many flowers expand in the sun; but contract at night, or on the approach of rain. After the seeds are fecundated, the petals no longer contract. All the trefoils may serve as a barometer to the husbandman; they always contract their leaves on an impending storm. Some plants follow the sun, others turn from it. Many plants, on the sun's recess, vary the position of their leaves, which is styled the *sleep of plants*. A singular plant, a species the *Hedysarum*, was lately discovered in Bengal. The leaves of it are in continual motion all day long; but when night approaches, they fall down from an erect posture to rest.

A plant has the power of directing its roots for procuring food. The red whortle-berry, a low evergreen plant, grows naturally on the tops of our highest hills, among stones and gravel. This shrub was planted in an edging to a rich border, under a fruit wall. In two or three years, it over-ran the adjoining deep-laid gravel walk; and seemed to fly from the border, in which not a single runner appeared. An effort to come at food in a bad situation, is extremely remarkable in the following instance. Among the ruins of New Abbey, formerly a monastery in Galloway, there grows on the top of a wall, a plane-tree about 20 feet high. Straitened for nourishment in that barren situation, it several years ago directed roots down the side of the wall, till they reached the ground ten feet below; and now the nourishment it afforded to those

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roots during the time of their descending is amply repaid, having every year since that time made vigorous shoots. From the top of the wall to the surface of the earth, these roots have not thrown out a single fibre; but are now united in a single root.

Plants, when forced from their natural position, are endowed with a power to restore themselves. A hop-plant, twisting round a stick, directs its course from south to west, as the sun does. Untwist it, and tie it in the opposite direction: it dies. Leave it loose in the wrong direction: it recovers its natural direction in a single night. Twist a branch of a tree so as to invert its leaves, and fix it in that position: if left in any degree loose, it untwists itself gradually, till the leaves be restored to their natural position. What better can an animal do for its welfare? A root of a tree meeting with a ditch in its progress, is laid open to the air. What follows? It alters its course like a rational being, dips into the ground, surrounds the ditch, rises on the opposite side to its wonted distance from the surface, and then proceeds in its original direction. Lay a wet sponge near a root laid open to the air; the root will direct its course to the spunge. Change the place of the sponge; the root varies its direction. Thrust a pole into the ground at a moderate distance from a scandent plant: the plant directs its course to the pole, lays hold of it, and rises on it to its natural height. A honeysuckle proceeds in its course, till it be too long for supporting its weight; and then strengthens itself by shooting into a spiral. If it meet with another plant of the same kind, they coalesce for mutual support; the one screwing to the right, the other to the left. If a honeysuckle twig meets with a dead branch, it screws from the right to the left. The claspers of briony shoot into a spiral, and lay hold of whatever comes in their way for support. If, after compleating a spiral of three rounds, they meet with nothing, they try again by altering their course.

By comparing these and other instances of seeming voluntary motion in plants, with that share of life wherewith some of the inferior kinds of animals are endowed, we can scarcely hesitate to ascribe the superiority to the former; that is, putting sensation out of the question. Muscles, for instance, are fixed to one place as much as plants are; nor have they any power of motion, besides that of opening and shutting their shells: and in this respect they have no superiority over the motion of the sensitive plant; nor does their action discover more sagacity, or even so much as the roots of the plane-tree mentioned by Lord Kaimes.

Mr. Buffon, who seems to be desirous of confounding the animal and vegetable kingdoms, denies sensation to be any essential distinction. "Sensation (says he) more essentially distinguishes animals from vegetables: but sensation is a complex idea, and requires some explication. For if sensation implied no more than motion consequent upon a stroke or an impulse, the sensitive plant enjoys this power. But if, by sensation, we mean the faculty of perceiving and comparing ideas, it is uncertain whether brute animals are endowed with it. If it should be allowed to dogs, elephants, &c. whose actions seem to proceed from motives similar to those by which men are actuated, it must be denied to many species of animals, particularly to those which appear not to possess the faculty of progressive motion. If the sensation of an oyster, for example, differed only in degree from that of a dog; why do we not ascribe the same sensation to vegetables, though in a degree still inferior? This distinction, therefore, between the animal and vegetable, is neither sufficiently general nor determined.

"From this investigation we are led to conclude, that there is no absolute and essential distinction between the animal and vegetable kingdoms; but that nature proceeds, by imperceptible degrees, from the most perfect to the most imperfect animal, and from that to the vegetable tribes; and the fresh-water polypus may be regarded as the last of animals, and the first of plants."

It were to be wished, that philosophers would on some occasions consider, that a subject may be dark as well on account of their inability to see, as when it really affords no light. Our author boldly concludes, that there is no essential difference between a plant and an animal, because we ascribe sensation to an oyster, and none to the sentitive plant; but we ought to remember, that, though we cannot perceive a distinction, it may nevertheless exist. Before Mr. Buffon, therefore, had concluded in this manner, he ought to have proved that some vegetables were endowed with sensation.

It is, no doubt, however, as much incumbent on those who take the contrary side of the question, to prove that vegetables are not endowed with sensation, as it was incumbent on Mr. Buffon to have proved that they are. But a little attention will shew us, that the difficulty here proceeds entirely from our inability to see the principle of sensation. We perceive this principle in ourselves, but no man can perceive it in another. Why then does every individual of mankind conclude that his neighbour has the same sensations with himself? It can only be from analogy: every man perceives his neighbour formed in a manner similar to himself; he acts in a similiar manner on similar occasions; *&c.* Just so it is with brute animals. It is no more doubtful that they have sensations, than that we have them ourselves. If a man is wounded with a knife, for instance, he expresses a sense of pain, and endeavours to avoid a repetition of the injury. Wound a dog in the same manner, he will also ex-

press a sense of pain; and, if you offer to strike him again, will endeavour to escape, before he feels the stroke. To conclude, here, that the action of the dog proceeded from a principle different from that of the man, would be absurd and unphilosophical to the last degree.

We must further take notice, that there are sensations essentially distinct from one another; and in proportion as an animal is endowed with more or fewer of these different species, it is more or less perfect as an animal: but, as long as one of them remains, it makes not the least approach to the vegetable kingdom; and, when they are all taken away, is so far from becoming a vegetable, that it is only a mass of dead matter. The senses of a perfect animal, for instance, are five in number. Take away one of them, suppose sight; he becomes then a less perfect animal, but is as unlike a vegetable as before. Suppose him next deprived of hearing: his resemblance to a vegetable would be as little as before; because a vegetable can neither feel, taste, nor smell, and we suppose him still to enjoy these three senses. Let us, lastly, suppose him endowed only with the sense of feeling, which, however, seems to include that of taste; and he is no more a vegetable than formerly, but only an imperfect animal. If this sense is then taken away, we connect him, not with the vegetable kingdom, but with what Mr. Buffon calls *brute-matter*. It is to this kingdom, and not to the vegetable, that animals plainly approximate as they descend. Indeed, to suppose an approximation between the vegetable and animal kingdoms, is very absurd: for, at that rate, the most imperfect animal ought to be the most perfect plant; but we observe no such thing. All animals, from the highest to the lowest, are possessed of vegetable life; and that, as far as we can perceive, in an equal degree, whether the animal-life is perfect or imperfect: nor does there seem to be the smallest connexion between the highest degree of vegetation and the lowest degree of sensation. Though all animals, therefore, are possessed of vegetable life, these two seem to be as perfectly distinct and incommensurate to one another, as one can possibly imagine.

The power of vegetation, for instance, is as perfect in an onion or leek, as in a dog, an elephant, or a man: and yet, though you threaten a leek or an onion ever so much, it pays no regard to your words, as a dog would do; nor, though you wound it, does it avoid a second stroke. It is this principle of self-preservation in all animals, which, being the most powerful one in their nature, is generally taken, and with very good reason, as the true characteristic of animal-life. This principle is undoubtedly a consequence of sensation; and as it is never observed to take place in vegetables, we have a right to say that the foundation of it, namely sensation, belongs not to them.—There is no animal, which makes any motion in consequence of external impulse, where danger is threatened, but what puts itself in a posture of defence; but no vegetable whatever does so. A muscle, when it is touched, immediately shuts its shell; and as this action puts it in a state of defence, we conclude that it proceeded from the principle of self-preservation. When the sensitive plant contracts from a touch, it is no more in a state of defence than before; for whatever would have destroyed it in its expanded state, will also do it in its contracted state. We conclude, therefore, that the motion of the sensitive plant proceeds only from a certain property called by physicians *irritability;* and which, though our bodies possess it in an eminent degree, is a characteristic neither of animal nor vegetable life, but belongs to us in common with brute-matter. It is certain, that an electrified silk-thread shews a much greater variety of motions than any sensitive plant. If a bit of silk-thread is dropt on an electrified metal-plate, it immediately erects itself; spreads out the small fibres like arms; and, if not detained, will fly off. If a finger is brought near it, the thread seems greedily to catch at it. If a candle approaches, it claps close to the plate, as if afraid of it.—Why do we not conclude that the thread in this case is really afraid of the candle? For this plain reason, that its seeming flight is not to get away from the candle, but to get towards the electrified metal; and if allowed to remain there, will suffer itself to be burnt without offering to stir.—The sensitive plant, in like manner, after it has contracted, will suffer itself to be cut in pieces, without making the least effort to escape. The case is not so with the meanest animal. An hedge-hog, when alarmed, draws its body together, and expands its prickles, thereby putting itself in a posture of defence. Throw it into water and the same principle of self-preservation prompts it to expand its body, and swim. A snail, when touched, withdraws itself into its shell; but if a little quicklime is sprinkled upon it, so that its shell is no longer a place of safety, it is thrown into agonies, and endeavours to avail itself of its locomotive power in order to escape the danger. In muscles and oysters, indeed, we cannot observe this principle of self-preservation so strongly, as nature has deprived them of the power of progressive motion: but as we observe them constantly to use the means which nature has given them for self-preservation, we can have no reason to think that they are destitute of that principle upon which it is founded.

But there is no need of arguments drawn from the inferior creation.—We ourselves are possessed both of the animal and vegetable life, and certainly must know whether there is any connexion between vegetation and sensation or not.—We are conscious that we exist; that we hear, see, &c.: but of our vegetation we are absolutely inconscious. We feel a pleasure, for instance, in gratifying the calls of

hunger, and thirst; but of the process by which our aliment is formed into chyle, the chyle mixed with the blood, the circulation of that fluid, and the separation of all the humours from it, we are altogether ignorant. If we then, who are more perfect than other vegetables, are utterly insensible of our own vegetable life, why should we imagine that the less perfect vegetables are sensible of it?

To illustrate this by an example.—The direction of the roots of the plane-tree mentioned by Lord Kaimes, shews as much sagacity, if we are to look only to the outward action, as can be observed in any motion of the most perfect animal whatever; nevertheless, we have not the least suspicion, either that the tree saw the ground at a distance, or that it was informed of its being there by the rest of its roots. If a wound is made in the body of a man, and a loss of substance is to be repaired, the same sagacity will be observed in the arrangement of the fibres, not only as if they were animated, but they will dispose of themselves seemingly with a degree of wisdom far superior to what we have any idea of; yet this is done without our having the least knowledge either how it is done, or of its being done at all. We have therefore in ourselves a demonstration, that vegetable life acts without knowing what it does: and if vegetables are ignorant of their most sagacious actions, why should we suspect that they have a sensation, let it be ever so obscure, of any of their inferior ones, such as contracting from a touch, turning towards the sun, or advancing to meet a pole?

Thus we may easily give Mr. Buffon a reason why we ascribe sensation to an oyster, and none to a vegetable; namely, because we perceive the vegetable do nothing but what is also performed in our own bodies, without our having the least sensation of it; whereas an oyster puts itself in a defensive posture on the approach of danger; and this being an action similar to our own upon a like occasion, we conclude that it proceeds from the same principle of sensation. Here it may also be observed, that though the inferior animals are deficient in number, they are by no means so in the acuteness, of their sensations; on the contrary, though a muscle or an oyster is probably endowed with no other sense than that of feeling, yet this sense is so exquisite, that it will contract upon the slightest touch, such as we should be altogether insensible of.

As to that power of contractility, or irritability, which is observed in some plants; our solids have it when deprived both of vegetable and animal life; for a muscle, cut out of a living body, will continue to contract, if it is irritated by electricity or galvanism, or by pricking, after it has neither sensation nor vegetation. See GALVANISM.

As, in a plant, there exists a certain power, totally different from that of attraction or repulsion, by which its food, after having been attracted, or otherwise brought to it, is assimilated to its substance, so is it, in a more eminent degree, the case with animals. The alimentary substance is changed into two kinds of matter. There is an excrementitious one, which passes off through the intestines; and a fluid, which is the direct pabulum of the animal. Different substances, however, are not equally changeable by this process. The human stomach is not capable of acting upon any animal substance till it has lost its vital principle: the stomachs of some animals cannot act upon creatures of their own species: some have an apparatus for grinding their food after it is swallowed, &c. and there are no animals but what are subject to death by taking certain substances into their stomachs. Some substances also, though they resist the action of the stomach, and pass unchanged into the system, produce no bad effects. Thus, madder will turn the bones of animals red; rhubarb will communicate its purgative nature to the milk, and its deep yellow colour to the urine.—All these changes, however, seem to belong to the vegetative part of our system: for as every one of them are performed without our knowledge of the manner how; and not only so, but while we are absolutely unconscious of their being done; we can have no reason to suppose, that the *animal* life, properly so called, is at all connected with them, any farther than as they are at present the means of preserving the creature alive, and making the connexion betwixt the principle of life and this visible creation. All substances proceeding from animals are said to belong to the *animal kingdom*, to distinguish them from the vegetable and the mineral classes. The oils and fats of animals, like the gross oil of vegetables, are not of themselves soluble, either in water or in spirit of wine; but by the intervention of a third body, as mucilage or gum, &c. they may be rendered miscible with either. The oils of animals differ from those of vegetables in this way; 1. The finer animal oils are not, like the vegetable, procured by a moist, but by a dry distillation, that is, by combustion, and hence all animal oils have an empyreumatic smell. 2dly. Though an acid (the *sebacic)* is found in the fat of animals, yet in the oils distilled from animal substances, a volatile alkali is procured; whereas in the distilled oils of vegetables there is always an acid. The volatile alkaline salts, therefore, contained in the oils of animals, is the reason why the latter are more penetrating than the distilled oils of vegetables, and have a more immediate tendency to act as sudorifics. See ANIMAL OIL. The odorous matter of some animal substances, as musk, castor, &c. is like the essential oils of vegetables, soluble in rectified spirit of wine, and volatile in the heat of boiling water.

The description, history, and classing of animals, belong to ZOOLOGY; but we shall here insert,

M. DAUBENTERS'S DIVISION *and* CHARACTERS *of the Eight Classes of* ANIMALS.

<table>
<tr><td colspan="6">Having a head.</td><td colspan="2">The most part having no head.</td></tr>
<tr><td colspan="6">With nostrils.</td><td colspan="2">Without nostrils.</td></tr>
<tr><td colspan="6">With ears.</td><td colspan="2">Without ears.</td></tr>
<tr><td colspan="3">Two ventricles in the heart.</td><td colspan="3">One ventricle in the heart.</td><td colspan="2">The heart variously formed, or unknown.</td></tr>
<tr><td colspan="3">Warm blood.</td><td colspan="3">The blood nearly cold.</td><td colspan="2">A whitish fluid instead of blood.</td></tr>
<tr><td colspan="3">Inspiring and expiring air frequently.</td><td colspan="2">Inspiring and expiring air at long intervals.</td><td>Admitting the air by gills.</td><td>Admitting the air by spiracula.</td><td>No apparent entrance or aperture to admit air.</td></tr>
<tr><td colspan="2">Viviparous.</td><td colspan="6">Oviparous.</td></tr>
<tr><td colspan="2">With teats.</td><td colspan="6">Without teats.</td></tr>
<tr><td>1st Order. QUADRUPEDS.</td><td>2d Order. CETACEOUS ANIMALS.</td><td>3d Order. BIRDS.</td><td>4th Order. OVIPAROUS QUADRUPEDS.</td><td>5th Order. SERPENTS.</td><td>6th Order. FISHES.</td><td>7th Order. INSECTS.</td><td>8th Order. WORMS.</td></tr>
<tr><td>Four feet and hairy skin.</td><td>Fins and no hair.</td><td>Feathered.</td><td>Four feet and no hair.</td><td>Scaly without feet or fins.</td><td>Scaly with fins.</td><td>Having antennæ.</td><td>Having neither feet nor scales.</td></tr>
</table>

ANIMAL ACTIONS. See ACTIONS. Those actions, or functions, are so termed, which are performed through the means of the mind. To this class belong the external and internal senses, the voluntary action of the muscles, voice, speech, watching, and sleep.

ANIMAL ELECTRICITY. See GALVANISM.

ANIMAL FLOWER, a name given to several species of animals belonging to the genus of *Actinia* of Linnæus. They have likewise been distinguished by the names of *Urtica Marina.* or *Sea-nettle*, from their supposed property of stinging; and *Sea-anemone*, from their claws or tentacles being disposed in regular circles, and tinged with a variety of bright lively colours, resembling the petals of some of our most beautiful flowers. As to one species particularly, mentioned by Abbe Diequemarre (Phil. Trans. for 1773, art. 37.) the purest white, carmine, and ultramarine, are said to be scarce sufficient to express their brilliancy. The bodies of some of them are hemispherical, of others cylindrical, and of others shaped like a fig. Their substance likewise differs; some are stiff and gelatinous, others fleshy and muscular; but all of them are capable of altering their figure when they extend their bodies and claws in search of food. They are found in many of the rocky coasts of the West India islands, and likewise on some parts of the English coast.

ANIMAL FLUID, or ANIMAL MIXT; a name given by Dr. Cullen to that which is destined to supply the daily waste which an animal body experiences. It consists of the nutritious particles derived from the aliments after assimilation. See ALIMENTS.

ANIMAL FOOD, that article of human sustenance which is derived from the inferior orders of living beings, particularly quadrupeds and birds. It has been shewn under the article ALIMENTS, how far vegetables contribute to nutrition, and are capable of sustaining the health and vigour of the body; to this head belongs the inquiry respecting the effects of animal food in general, and of the particular kinds of it in common use.

The first effect which Dr. Cullen takes notice of with regard to animals as food, is, their affording, in the same proportion taken in, more nourishment than vegetable aliments do. The latter certainly can afford the whole of the required juices of the human body, but not in proportion to the quantity of them taken into the stomach; whilst animal substances that can be entirely dissolved in the gastric juice, seem, *in proportion to that quantity*, to be entirely convertible *in succum et sanguinem*. But, at the same time, it must be observed, that if they are in the smallest quantity less perspired, they greatly increase the plethoric state of the blood-vessels. Animal food, therefore, is always ready to induce this state: and in growing bodies, such food will always favour, and probably hasten, the growth: and although in adults, exercise and other means, by supporting the excretions, may prevent its having this effect, yet it will always have a tendency to produce a plethora

and increase of bulk. Moreover, as animal aliments for the most part introduce a greater proportion of oily matter, they are ready to occasion a large secretion of oil into the adipose membrane, and thereby produce obesity; which, when considerable, must impede and press upon the sanguiferous vessels, and consequently produce local plethora.

"Animal food" says Dr. Cullen, "having thus a considerable tendency to fill the blood-vessels, so it must support the constant tension of them, and thereby, in my opinion, give a greater degree of strength to the whole body; and from the doctrines laid down above on the subject of irritability, it will also readily appear, that animal food is likely to increase the irritability of the system.

"It deserves to be particularly attended to, that as the balance between the several parts of the system may not always be exact, so the plethoric state may be greater in one part than in another; and thus if it happens to give a greater tension to the vessels of the brain, it may dispose to epilepsy; or if it happens to give an increased tension to the vessels of the lungs, it may dispose to asthma. More particularly, if it be considered, that in all full systems, the lungs must always be most exquisitely filled; and that nature has provided that the vessels of the brain should always have a due degree of tension: so it will be readily understood why these two parts of the system must always be readily affected by every unusual fulness of the sanguiferous system, and from the general irritability at the same time induced, may give occasion to many particular diseases.

"It is also to be observed, that when animal food gives a general fulness of the blood-vessels, if the balance between the arteries and veins be not exactly adjusted, an undue proportion may take place; and if more than usual is retained in the arteries, it may give occasion to arterial hœmorrhagy; or, if a greater quantity of blood than usual is thrown upon the veins, it may produce an overcharge either in the system of the vena portarum, or in the venous system of the head the consequences of which are well known."

Hence it may truly be said of this species of food, that its effects are especially to give a nicer balance in several respects to the system, and thereby afford a disposition to many diseases which might be avoided by a more temperate use of such food. For though a limited quantity, with exercise suitable to it, may long render it not inconsistent with health, yet as the continuance of health is rendered more precarious by the constant use of it, so every unusually large indulgence in it must be extremely dangerous.

Dr. Cullen thus states his ideas of the effects of animal food, as it is immediately taken into the stomach:

"I am of opinion," says he, "that every kind of food taken into the stomach, as soon as it sets this organ to work, increases the action of the heart, and occasions a frequency of pulse; and if I mistake not, by the energy of the brain's being thus directed to the heart and stomach, a torpor in the animal functions, both of sense and motion, is induced, and often to a degree of sleepiness. These are the effects of food soon after it is taken into the stomach; and it seems also manifest, that these effects are *more considerable from animal* than from vegetable food. It seems also equally manifest, that the feverish state during digestion is in proportion to the alkalescency of the animal food taken in, and that the degree of torpor induced, and the continuance of the feverish state, is more or less according to the quantity of food taken in, and according to its being more or less readily soluble by the gastric juice.

"From these considerations, the whole phenomena of digestion, with respect to the system, may be explained: it seems on the whole, that although animal food may be admissible by the human œconomy, and in certain circumstances that it may be proper and even necessary; and, therefore, in many cases, it may be very consistent with health: yet that, for the most part, *a small portion of it only is necessary; the very temperate and sparing use of it being the surest means of preserving health and obtaining long life;* whilst the large use of it tends to the production of diseases, and to the aggravation of those that may arise from other causes."

On a question that especially relates to the effects of animal food; namely, whether sleeping after a full meal be suitable to the health of the human œconomy? Dr. Cullen says: "If we are to trust to the institution of nature in the brute creation, and suppose that their instincts are generally suited to the health of their œconomy, it would appear that sleep after eating is suited to favour their digestion; but whether the same may be suited to the human œconomy may be doubtful. The propensity to sleep after eating is commonly the same in man as in brutes; and I am persuaded that, in elderly persons after a mid-day meal, it may, in some degree, be indulged; but I am equally persuaded from my observation and experience, that a full supper immediately before going to bed is generally hurtful. Whether this happens in those persons especially who eat two meals of animal food every day, or take a long sleep after such meals, during which, not only the animal, but also the natural and vital functions must have a great deal of rest, is a circumstance that we cannot positively determine."

The Doctor, however, admits, that the solution of this and many other such questions, is greatly embarrassed by this: that errors in the conduct of

what relates to health, when moderate in their degree, are not easily discovered, as the consequences of them do not immediately show themselves; but only after a long time, and in consequence of frequent repetition, when, from our gross ignorance of the animal œconomy, we either do not perceive or readily mistake the cause of the disease coming on.

Farther, as to the qualities of aliments taken from the quadrupeds in common use, we must next endeavour to point out which of those qualities predominate, and how these are diversified in the several genera and species.

1. Animals of the Ox kind.—The flesh of these quadrupeds, Dr. Cullen says, is the most dense of all; and how far that goes in preventing its solution in the stomach, we have an instance in the bull, whose flesh is seldom chosen as a part of our diet. The flesh of the female, however, is of a much more suitable nature, and sufficiently fit for nourishment; but we commonly prefer the castrated ox, in which the fat is better mixed, and the flesh more alkalescent, unless it be taken from a very old animal.

The chief difference existing in this kind of aliment, is that between the old and the young; the flesh of which last is named Veal. This, as less dense, appears in our decoctions to be more soluble; and, in consequence of this, gives more of a gelatinous extract than the flesh of the adult: but it is not, therefore, more nutritious, as the gastric juice has stronger solutive powers than water in broths.

The softer texture of young animals depends upon there being little difference between the muscular fibres and the cellular texture interposed between them. But this state is limited to a certain period of their growth. In veal it is when they are under two months old; for after that, and sometimes before it, the muscular fibres become more distinguishable, and the whole substance becomes less tender. Veal indeed yields a more gelatinous decoction than beef; but this admits of a different explanation.

2. The Sheep kind.—These afford a dense substance (but less so than that of the ox kind), named *mutton*. The difference of sex has the same effects in this as in the ox kind; and still more clearly the flesh of the castrated animal is to be preferred. The meat of this animal is more sapid, and seemingly more easily digested at a certain advanced period of its life, than when it is younger. Mutton under two years old, is less sapid and more difficultly digested than when it is several years older; and it seems to be in its greatest perfection at the age of five. This may be ascribed in part to its alkalescency, which is greater at that period than when younger; but especially to the proportion in which the fat is to the solid fibres between which it is interposed. How far these circumstances take place, as some suppose, at a period of life still more advanced, Dr. Cullen does not determine; but he thinks it must have its limits, as the density of the solid increasing as life advances, may, at a certain period, very much diminish its solubility in the stomach. He contends that the same difference takes place between the young and old of the sheep, viz. between lamb and mutton, as in the ox kind, between veal and beef. Lamb, however, is subjected to a particular management. If the lamb is allowed to suck its mother for six months or longer, it becomes an aliment more nourishing and digestible than that of a lamb of the same age that has been weaned, as is usual, at the end of two months.

3. Animals of the Goat kind.—These have their muscular fibres more dense and insoluble than those of the sheep, partly from their nature and partly from their food and exercise; so that the flesh even of the castrated goat is seldom admitted to our tables.

4. The Sow kind.—The peculiarity of this genus consists in the quantity of oily matter which is accumulated in the adipose membrane separately from the muscular parts, and that in greater proportion than in any other of the quadrupeds employed as food.

Under the article Aliment we have said that the oil of animals enters into the composition of the animal fluid, and is therefore a directly nutritious matter, and that it is further necessary, for many purposes of the animal œconomy, to be laid up in the adipose membranes of the human species. In this view, therefore, it is certain, that the flesh of quadrupeds is a more nutritious, and a more proper aliment, as it contains a greater portion of oily matter, provided only that this is not more than our digestive organs can assimilate. In this respect the digestive powers are very different in different persons. In some, the power of assimilating oily matter is very great, while in others it is extremely limited; and frequently in the same persons it is different at different periods.

There exists, in the sow species, the same difference as in other quadrupeds, between the flesh of the young and of the adult animal; and here the difference turns upon the pig, or young animal, being always less fat than that of the adult. Hence it is more digestible to many persons who cannot digest the flesh of the adult. As in other species also, there is some difference from the sex; and from the castrated male and one that is entire; but it appears that these differences are less considerable than in any of the other species of quadrupeds. This species affords a food prepared in a manner that cannot be applied to any other; viz. brawn, a substance not readily soluble, but, in such stomachs as can dissolve it, affording a

great deal of nourishment. Brawn, seems properly to consist of the adipose membrane closely compressed; so that much of the oil is squeezed out, while the cellular texture remains so closely united as to form a transparent substance like soft horn.

5. The Deer or Venison.—It is to the genus *Cervus*, that the term venison is most properly and strictly applied. There are three species employed as food in this country; viz. the *stag*, the *fallow deer*, and the *roe*. They are all wild animals and much exercised, therefore, alkalescent; and though of a dense substance, yet at a proper age, and when tolerably fat, sufficiently soluble and nourishing to the body, as the shining faces of some of our corporate bodies can testify.

6. The Hare.—This animal being wild and much exercised, has its flesh dense and not easily soluble; but it is an alkalescent food, and is, therefore, more easily digested, and proves tolerably nourishing. As it is an animal of chace, and often only killed after long exercise, it is therefore often much deprived of the oil that should be in its cellular texture; and is then more difficultly digested than when it is suddenly killed; though from the fact of its being tenderer in eating, this is not generally supposed to be the case.

7. The Rabbit.—A species of the same genus with the hare, but by nature, as well as from being but little exercised, of a very different quality. It is of such a dense substance that we hardly ever employ the adult of this animal. Young rabbits are tender and white, and afford an aliment very digestible, and considerably nourishing to the body.

Here Dr. Cullen takes occasion to mention the difference between the white and red meats, which is often the subject of particular opinions, and was long ago marked by Dr. Cheyne. "This difference," says he, "depends upon the greater number of red arteries, and, therefore, upon the larger quantity of red globules interposed between the muscular fibres in the one case than in the other. As it is probable that the red globules of the blood are considerably alkalescent, it will follow, that the red flesh is more alkalescent than the white, agreeably to what we have said above, that the substance of young animals, in which the white fibres are especially found, is less alkalescent than that of the old. It is properly, therefore, that the white meats are considered as less irritating than those of a red colour; abstracting, however, from the effects in the stomach and bowels that may happen from their gelatinous nature." How far the quantity of red globules in a given portion of flesh meat may affect its capability of nourishment, is not easily determined; but there seems to be some reason for supposing this property to be greater in red meats than in white; and if so, there is a further reason for supposing it greater in old animals than in young.

The use of the flesh of birds as food, and of fish, is spoken of under the articles Birds, Fish, &c.

ANIMAL HEAT, a most important object of modern inquiry, in which the late Dr. Adair Crawford, and other philosophical men, have engaged, particularly of late years. Animal heat is that which is generated by the mere power of the animal functions, and totally independent of the heat communicated by surrounding objects.

Many important facts relative to respiration have, since very remote periods, been well investigated and ascertained. Since the more modern discoveries, however, many philosophers have ingeniously explained some of the functions of the animal œconomy, and particularly that of the lungs, by reasonings purely chemical. We cannot give a decided opinion upon these subjects, but we will, in as short a manner as possible, present an outline of the latter, and attempt to shew, that some difficulties will present themselves to those who consider it too chemically.

Experiments fully demonstrate, that the pure part of the air is materially altered by respiration. The capacity of this for heat far exceeds that of the expired gases; from which it is evident, that a considerable portion of heat has been, in some manner, disposed of, during the contact of the inspired air with the membrane which lines the air-cells of the lungs.

The blood is formed from animal or vegetable matter, or from both, and, like each of them, abounds in hydrogen and carbon; both these bodies have a strong affinity for the basis of oxygen gas, and, when they combine with it, caloric is always extricated.

According to Dr. Crawford, nearly one-sixth of the oxygen gas inspired contributes to form aqueous vapour; the remaining five-sixths enter into the composition of the expired carbonic acid gas. Now, both these bodies being denser than pure air, the last nearly in the proportion of 2 to 1, it is evident, that, if a certain quantity of oxygen gas were to be instantly decomposed by the carbon in the lungs, to the production of carbonic acid gas, the heat that would be evolved from their difference of capacity, would be immediately set at liberty, and be productive of a very high degree of temperature, if it were not absorbed by the blood at the instant of its liberation.

It appears, that the inspired air comes very nearly into contact with the blood contained in the minute ramifications of the pulmonary artery, in which it is highly charged with hydro-carbonaceous matter, and that the pure part of it is decomposed by that combustible substance, to the formation of aqueous vapour and of carbonic acid gas, the capacity of which being less than the capacity of

oxygen gas, the superabundant heat immediately combines with the blood thus deprived of a portion of its carbone and hydrogen (and thus increased in capacity) to form arterial blood.

In the act of respiration then, the venous blood loses some combustible principles, by which its capacity becomes increased, and, at the same time, combines with the heat that results from the difference of capacity which exists between the inspired and expired gases.

In the course of circulation, especially through the capillary vessels, the blood continually takes up hydro-carbonaceous matter, by which its capacity for heat becoming diminished, sensible heat is gradually evolved, and the animal body thereby chiefly preserves its temperature.

When warm blooded animals are placed in a cold medium, their venons blood assumes a much darker hue than when they are placed in a warmer; for, as the animal heat greatly depends upon the evolution of the heat from the blood, in consequenee of its combination with hydro-carbonaceous matter, more especially in the capillaries; so, therefore, when animals are placed in a cold medium, they deteriorate more air in a given time than when they are placed in a warmer; and hence it appears, that the quantity of heat which is separated from the air, and absorbed by the blood in the act of respiration, is, in every instance, and, cæteris paribus, proportioned to the necessity; there may then possibly be a certain degree of temperature at which arterial blood ceases to combine with the hydro-carbonaceous matter, and when there, consequently, cannot be a decomposition of pure air in the lungs, unless indeed it arises from the action of the chyle, which the blood acquires before it circulates through the lungs, and independently of that substance, which is probably chiefly secreted by the capillary vessels.

The rarity of the air in tropical, and its density in polar, climates, might be adduced as a cause of the permanency and nearly equal degrees of animal heat in those situations; but, if this were the case, a highly carburetted state of the arterial blood would be found in the former, which, with Mr. Tupper we believe, is not the fact.

It is rather extraordinary, that the animal heat, in the case before us, was not considerably less than has been noticed. It is, however, probable, that the blood was more completely carburetted in the act of circulation, than if the usual circumstances had existed (for, when any part of the system is affected, the powers of life are often preternaturally exerted in another connected with it): and, if this conjecture be allowed, a comparatively greater proportion of the heat, which was imparted to the blood in the lungs, must necessarily have been separated in the body.

The author last mentioned, of whose observations we here avail ourselves, has justly observed, that the oxydation of the blood is a subject still involved in some obscurity. It cannot, he thinks, be ascertained, whether the basis of oxygen gas combines with the blood in the act of respiration, and afterwards circulates with it in a chemically combined state, unless it is proved that the quantity of it consumed in that process exceeds that which forms one of the component parts of the aqueous vapour and carbonic acid gas expired: and, if the proportion of oxygen in the two latter be greater than that which is inspired, another source of difficulty will again present itself; for, we have no method of distinguishing that aqueous vapour which, it is supposed, is formed by the combination of the basis of oxygen gas, and a portion of the hydrogen of the blood, and that which some of the vessels situated on the membrane which lines the cells of the lungs secrete, in common with those of other membranous surfaces. Lavoisier and Seguin have made some experiments, from which they were induced to believe, that the quantity of oxygen gas consumed in respiration was greater than that which enters into the composition of the gases and vapour expired; but some doubts concerning this important subject seem still to remain with many eminent physiologists.

The consideration of the placental circulation, and of the change which is effected on the blood contained in those minute branches of the umbilical arteries which ramify upon the membrane lining the cells of the maternal part, would, however, rather seem to favour the idea of oxydation. It is well known that the maternal and fœtid systems cannot be injected by one another, and that the blood of the umbilical vein is more florid than that in the umbilical arteries. Now, if it could be proved that the extremities of the umbilical vein took up the blood from the maternal part of the placenta, a good reason might be assigned for the change of colour; but this has not been proved, and the analogy goes against it. The change, therefore, probably, either depends upon something which is taken up by the vessels, and combines with the blood contained in them; or, it may more probably take place in the same manner as in ordinary respiration; but with this difference, that the maternal blood itself (on a supposition that it has combined with oxygen in the lungs) imparts a portion of it to the blood in the fœtal vessels, either at minute open mouths, or by passing currents, and consequently through the coats of the vessels and the membrane of the cells.

Some experiments, however, at which Mr. Tupper assisted, in some degree led him to suppose, that *oxygen does not combine with the blood in the act of respiration.* Several animals were confined in a certain quantity of hydrogen gas (which is not immediately fatal to life) which had been tested

with nitrous gas, and afterwards exposed, for some time, to a mixture of lime and lime-water. The animals remained under exposure a sufficient time to shew whether carbonic acid gas had been expired; but there was not found a larger portion in the hydrogen gas after the experiment than could be accounted for from the action of the atmospherical air which remained in the lungs of the animals after the exposure. If a portion of the expired carbonic acid gas were formed in the course of circulation, in consequence of the oxydation of the blood in the lungs, we ought necessarily to have detected a larger quantity of it; for the blood, in this case, must have been highly charged with oxygen at the time of the exposure; and the hydrogen gas, so far as we know, could not have prevented the free exit of carbonic acid gas from the extremities of the pulmonary veins.

Although animal heat has, of late, been principally (if not altogether) attributed to the decomposition of venous blood in the lungs, as before stated; yet many phænomena, which take place in the human body, certainly stagger opinion in this respect. It appears, from many circumstances, extremely probable, that calorie is received into the system, and separated from it in various other processes, more particularly perhaps during the digestion of our aliment. It is likewise very probable, that heat is evolved during the different secretions from the blood; and that the constant combinations and productions of new fluids by the glands, constitute a grand source of animal heat.

Many of the phænomena of animal life have been lately attributed to the influence of the oxygen taken into the body in the act of respiration; that basis, according to many philosophers, effects and explains many of those processes which will perhaps ever surpass the limits of human understanding. The laws of irritation, sensation, volition, &c. have been explained by the supposed influence of oxygen in the system. We cannot investigate a subject so abstruse; but no conclusion ought to be drawn which is not fully warranted by experiment. In the progress of investigation, we should proceed from known facts to what is still unknown; we should ever be cautious how we apply chemical theories to the human body. The wonderful effects which have been attributed to oxygen cannot be denied; but until the principle of life is better known, we shall perhaps fruitlessly attempt the solution of many phænomena by the prevailing theories of the day, and thus gradually add more and more to the already inexhaustible stock of speculations.

Mr. Tupper purposely avoids all calculations respecting the quantities of carbon and oxygen in carbonic acid gas, as well as a statement of the accurate differences in the capacities for heat of the gases, the venous, and the arterial blood. He likewise intentionally waves the consideration of the oxydation of the blood out of the body, which does not appear to him to be strictly analogical, when it is compared with the perspiratory process. But he proposes to the physiological and philosophical enquirer, the following queries:—Is the change which the blood undergoes in the lungs in the act of respiration referable to a *chemical* operation taking place in that viscus? If it be, he thinks, many difficulties will arise when we shall attempt the explanation. The principle of life acts where this process is accomplished; and can any one positively assert, that chemical laws have dominion in the human body? If that revolution which chemistry has lately undergone, had not been carried on and directed by men, who, to the greatest science, added a most profound knowledge of the animal œconomy, our schools would already have resounded with the extravagancies of a Paracelsus, which, it is to be feared, a wrong application of the beautiful science of chemistry would very soon again revive.

ANIMAL IMPREGNATION. See GENERATION.

ANIMAL OIL, OLEUM ANIMALE; an empyreumatic oil obtained from the bones of animals.

Oleum Animale. Lond.

Take of the Oil of hartshorn, one pound:
Distil it three times.

By the Dublin College, this oil is named *Oleum Cornu Cervini Rectificatum.* They order it thus:

Take of the oil which ascends in the distillation of the volatile liquor of hartshorn, three pounds; and of water, six pounds.
From these they draw off a pound and a half.

Mr. Model, a chemist of Petersburgh, took some pains to reduce the expense attending the repeated distillations of this oil, in order to render it pure. He directed the fœtid oil to be poured into a glass cucurbit, with an alembic head; so as not to foul the side of the vessel, and distilled with a gentle heat, separating, by a change of the receiver, the limpid oil which first comes over, from the more yellow, which follows; and in like manner the second from the third. To rectify the first limpid portion, one distillation with a slow fire is sufficient, but the other portions commonly require two; in which the limpid part must be separated in the same manner from the more impure which follows, by changing the receiver; and the process may thus be continued until all the oil flows limpid and pale.

Animal oil, duly rectified, is thin and limpid, of a subtile, penetrating, not disagreeable, smell and taste. With regard to its *medical uses*, it is strongly

recommended as an anodyne and antispasmodic, in doses of from 15 to 30 drops. Hoffmann says, it procures a calm and sweet sleep, which continues often for twenty hours, without being followed by any languor or debility, but rather leaving the patient more alert and cheerful than before: that it procures likewise a gentle heat, without increasing the heat of the blood: that, given to 20 drops or more, on an empty stomach, six hours before the accession of an intermittent fever, it frequently removes the disorder; and that it is likewise a very general remedy in chronic epilepsies, and in convulsive affections, especially if given before the usual time of the attack, and preceded by proper evacuations. How far empyreumatic oils possess the virtues that have been ascribed to them, Dr. Cullen says, has not yet been sufficiently determined by experience. Were it not for the tediousness and trouble of their rectification, their use might be considerable as a topical remedy. Empirics, indeed, have availed themselves of their properties; since, about thirty years ago, this remedy was sold under the name of "*British Oil*," and got considerable reputation as a liniment for stiff joints, chronic rheumatisms, &c. In common with other empyreumatic oils, animal oil is liable to a material inconvenience in regard to their medicinal use, namely, precariousness in its quality; for, how perfectly soever it be rectified, it gradually loses, in keeping, the qualities it had received from that process, and returns more and more towards its original fœtid state. See EMPYREMATIC OILS.

ANIMAL SPIRITS, or NERVOUS FLUID. See NERVES.

ANIMAL SUBSTANCES; differ from vegetable, principally in the following circumstances: *First*, they afford a considerable portion of ammonia, (see AMMONIA,) and very fœtid products by the action of fire. *Secondly*, they putrefy more easily and speedily, giving out a much worse smell. *Thirdly*, they yield, when acted on by the nitric acid, a much greater quantity of azotic gas; and, *lastly*, they contribute singularly to the formation of nitric acid.

These differences seem to depend on animal bodies being possessed of one substance in much greater abundance than vegetables, viz. AZOTE. Besides these circumstances, in which animal substances differ from vegetable, the former generally contain a quantity of phosphoric acid and calcareous earth.

Azote, which is so abundant in animal substances, is undoubtedly the cause of their concrescibility and plasticity. If we should deprive animal substances of their azote, they would be converted into substances resembling vegetables, and, if we could introduce azote into vegetable substances, we should animalize them.

All matters which form the bodies of animals, and which may be extracted from them without altering their nature, may be considered as so many immediate principles, as was done with respect to vegetables.

The principal animal fluids are, first, the blood, which consists of three immediate materials, or principles, the serum, the crassamentum, or coagulable part, and the colouring part, or red globules, as they are called. Second, milk, which is the least animalized of all the fluids, and consists of three immediate materials, serum, or whey, butter, and cheese. Third, the bile, which is a saponaceous fluid, consisting chiefly of an animal oil, combined with soda. Fat is nothing but animal oil in a coagulated state.

The substances which compose the solid parts of animals may likewise be divided into three immediate materials, or principal genera: First, albumen. Second, gelatin. Third, fibrin, or fibrous matter. These three substances, in a state of concretion and combination, form all the solids of animals, and are separable from each other by an easy analysis. These different immediate principles are particularly examined in chemistry.

By whatever means we deprive animal substances of their azote, we reduce them to substances resembling vegetables; the muscular fibre excluded from the contact of the air, but particularly if in contact with water, parts with its azote, and is converted into a substance resembling spermaceti, which, in its analysis, agrees with the common expressed oils of vegetables.

When vegetables and animals are deprived of life, movements are excited in them which destroy their texture, and alter their composition. These movements constitute the different kinds of fermentation.

When the saccharine principle is predominant in vegetables, the product of fermentation is a spirituous or vinous liquor: when mucilage is predominant, the product is an acid; and, if the gluten should prove most abundant, the fermentation will be of the putrefactive kind. Hence, it is evident, that vegetable substances may successively experience all the different kinds of fermentation.

When vegetable substances, particularly saccharine matters, are mixed in proper quantity with water, and exposed to a gentle heat, the water becomes decomposed; its oxygen combines with the carbon of the vegetable, forming carbonic acid, which is disengaged in large quantity during fermentation; at the same time, the hydrogen of the water, uniting with the mucilage, forms alkohol, which being mixed with water, and part of the carbon of the saccharine matter, together with extractive and colouring matter, is called wine. The alkohol may be separated from these matters by distillation with a gentle heat. Pure alkohol appears to be hydrogen in a liquid state, combined

with a small quantity of carbon, which most probably causes its fluidity; for we find that the more we deprive it of its carbon, the nearer it approaches to the state of hydrogen gas. Ether seems to be hydrogen, combined with much less carbon. It is convertible into gas with a gentle heat, which very much resembles hydrogen gas in its properties.

The acid fermentation is the next natural movement, which contributes to reduce vegetable compounds to more simple states of composition. After vegetables have passed through this state, their decomposition continuing under favourable circumstances, leads to the decomposition of the last principle, the gluten, which terminates in volatilizing most of their principles in the form of gas; after this, nothing remains but a brown or black residuum, called mould, composed of carbon, some salts, a little oil, and extractive matter.

When animal substances, deprived of life, are exposed to the air, their component parts soon become altered by more simple attractions between their principles, which have a tendency to unite two and two together. In the union of hydrogen and azote, we perceive the formation of ammoniac, the combination of carbon with oxygen, explains the evolution of carbonic acid. Nitric acid arises from the union of oxygen and azote. A quantity of hydrogen is extricated in the form of gas, carrying off with it sulphur and phosphorus, which causes the disagreeable smell that attends animal putrefaction; nothing now remains but a portion of carbon, mixed with phosphat of soda and phosphat of lime.

Hence we see, that, by the processes of fermentation and putrefaction, complex bodies are converted into substances less compound; and that nature restores, in the new combinations that are formed, the principles she had borrowed from the atmosphere for the formation of animals and vegetables; and thus she accomplishes the perpetual circle of compositions and decompostions, which demonstrates her fecundity, while it announces equal grandeur and simplicity in her operations.

ANIMALCULA, in general, signifies a little animal; and thus the term might be applied to every animal which is considerably inferior in size to ourselves. It has been customary, however, to distinguish by the name of animalcules only such animals as are of a size so diminutive, that their true figure cannot be discerned without the assistance of glasses; and, more especially, it is applied to such as are altogether invisible to the naked eye, and cannot even be perceived to exist but by the assistance of microscopes.

By the help of magnifying glasses, we are brought into a kind of new world. Numberless animals are discovered, which, from their minuteness, must otherwise for ever have escaped our observation: and how many kinds of these may yet remain is scarcely to be conceived; as they are discerned of all sizes, from those which are barely invisible to the naked eye, to such as resist the action of the most powerful microscopes.

The smallest living creatures our instruments can shew, are those which inhabit the waters; for though possibly animalcules equally minute, or perhaps more so, may fly in the air, or creep upon the earth, it is scarcely possible to bring such under our examination; but water being transparent, and confining the creatures in it, we are able, by applying a drop of it to our glasses, to discover, to a certain degree of smallness, all that it contains.

The discovery of spermatic animalcules, by Lewenhoeck, was thought to throw some light on the mysterious affair of generation, and these minute creatures were imagined to be each of them individuals of the same species with the parent. Here the infinite number of these animalcules was an objection, and the difficulty remained as great as before; for, as every one of these animalcules behoved to be produced from a male and female, to explain their origin by animalcular generation in the same manner, was only explaining generation by itself.

This hypothesis, therefore, having proved very unsatisfactory, others were invented; and Mr. Buffon, particularly, invented one, by which he at once annihilates the whole animalcular world; and in this he has been followed by several very ingenious philosophers. We shall here contrast his account with that of Lewenhoeck.

Having procured the seminal vessels of a man who died a violent death, he extracted all the liquor from them while they were still warm; and having examined a drop of it with a double microscope, it had the appearance of large filaments, which, in some places, spread out into branches, and in others intermingled with one another. These filaments clearly appeared to be agitated by an internal undulatory motion, like hollow tubes, which contained some moving substance. He saw distinctly this appearance change; and two of these filaments, which were joined longitudinally, gradually separated from each other in the middle, alternately approaching and receding, like two tense cords fixed by the ends, and drawn asunder in the middle. These filaments were composed of globules that touched one another, and resembled a chaplet of beads. After this, he observed the filaments swelled in several places, and perceived small globular bodies issue from the swelled parts, which had a vibratory motion like a pendulum. These small bodies were attached to the filaments by small threads, which gradually lengthened as the bodies moved. At last, the small bodies detached themselves entirely from the filaments, drawing after them the small thread, which looked like a tail. When a drop of the seminal liquor was di-

luted, these small bodies moved in all directions very briskly; and, had he not seen them separate themselves from the filaments, he would have thought them animals. The seminal matter was at first too thick, but gradually became more fluid; and, in proportion as its fluidity increased, the filaments disappeared, but the small bodies became exceedingly numerous. Each of them had a long thread or tail attached to it, from which it evidently endeavoured to get free. Their progressive motion was extremely slow, during which they vibrated to the right and left, and, at each vibration, they had a rolling unsteady motion in a vertical direction.

At the end of two or three hours, the seminal matter becoming still more fluid, a greater number of these moving bodies appeared. They were then more free of incumbrances; their tails were shorter; their progressive motion was more direct, and their horizontal motion greatly diminished. In five or six hours, the liquor had acquired almost all the fluidity it could acquire, without being decomposed. Most of the small bodies were now disengaged from their threads; their figure was oval. They moved forward with considerable quickness, and, by their irregular motions backward and forward, they had now more than ever the appearance of animals. Those that had tails adhering to them, seemed to have less vivacity than the others; and, of those that had no tails, some altered both their figure and their size. In twelve hours, the liquor had deposited, at the bottom of the vial, a kind of ash-coloured gelatinous substance, and the fluid at top was almost as transparent as water. The little bodies being now entirely freed from their threads, moved with great agility, and some of them turned round their centres. They also often changed their figures, from oval becoming round, and often breaking into smaller ones. Their activity always increased as their size diminished. In twenty-four hours, the liquor had deposited a greater quantity of gelatinous matter, which, being with some difficulty diluted in water, exhibited an appearance somewhat resembling lace. In the clear semen itself only a few small bodies were now seen moving; next day, these were still farther diminished; and, after this, nothing was to be seen but globules, without the least appearance of motion.

From these experiments, Mr. Buffon concludes, that what have been called spermatic animals, are not creatures really endowed with life, but something proper to compose a living creature; and he distinguishes them by the name of *organic principles.* The same individual kinds of animals, he declares, he has found in the fluids separated from the ovaria of females; and, for the truth of this, appeals to the testimony of Mr. Needham, who was an eye-witness of his experiments. He also brings an additional proof of his doctrine from Mr. Needham's observations on the milt of the *calmar*, a species of cuttle-fish. Here the spermatic animals, at least what have the only appearance of life, are vastly larger than in any other creature, so as to be plainly visible to the naked eye. When magnified they resemble springs inclosed in a transparent case. These springs were equally perfect at first as afterwards; only in time they contracted themselves, and became like a kind of screw. The head of the case is a species of valve which opens outward, and through which every thing within may be forced out. It contains, besides, another valve, a little barrel, and a spongy substance.—Thus the whole machine consists of an outer transparent cartilaginous case, the superior extremity of which is terminated by a round head formed by the case itself, and performs the office of a valve. This external case contains a transparent tube; which includes the spring, a piston or valve, a little barrel, and a spongy substance. The screw occupies the superior part of the tube and case, the piston and barrel are situated in the middle, and the spongy substance occupies the inferior part. These machines pump the liquor of the milt; the spongy substance is full of this liquor; and, before the animal spawns, the whole milt is only a congeries of these bodies which have sucked up all the liquor of it. Whenever these small machines are taken out of the body of the animal, and put in water, or exposed to the air, they begin to act; the spring mounts up, and is followed by the piston, the barrel, and the spongy substance which contains the liquor: and, as soon as the spring and the tube in which it is contained begin to issue out of the case, the spring plaits, and the whole internal apparatus moves, till the spring, the piston, and the barrel, have entirely escaped from the case. When this is effected, all the rest instantly follow, and the milty liquor which had been pumped in, and confined in the spongy substance, runs out through the barrel.

According to this account, the milt of the calmar contains no animalcules: and therefore we may from analogy conclude, that the small moving bodies which are to be seen in the semen of other animals, are not really creatures endowed with life. Mr. Buffon extends the analogy still further; and concludes, that all the moving bodies which are to be found in the infusions either of animal or vegetable substances are of a similar nature. "To discover, says he, whether all the parts of animals, and all the seeds of plants, contained moving organic particles, I made infusions of the flesh of different animals, and of the seeds of more than twenty different species of vegetables; and after remaining some days in close glasses, I had the pleasure of seeing organic moving particles in all of them. In some they appeared sooner, in others later; some preserved their motions for months, and others soon lost it. Some at first produced large moving globules resembling animals, which changed their figure, split, and became gradually smaller.—

Others produced only small globules, whose motions were extremely rapid: and others produced filaments, which grew longer, seemed to vegetate, and then swelled and poured forth torrents of moving globules."

This last observation gave rise to a new system. Baron Munchausen, perceiving that the last mentioned moving globules, after moving for some time, began again to vegetate, concluded that they were first animals and then plants. This strange hypothesis Mr. Ellis has disproved in a paper, in which he asserts, that they are no other than the seeds of that genus of fungi called *mucor* or *mouldiness*, and that their motion is owing to numbers of minute animalcules attacking them for food. "Having (says he), at the request of Dr. Linnæus, made several experiments on the infusion of mushrooms in water, in order to prove the theory of Baron Munchausen, that their seeds are first animals and then plants, (which he takes notice of in his System of Nature, p. 1326, under the genus of chaos, by the name of *chaos fungorum seminum)* it appeared evidently, that the seeds were put into motion by very minute animalcules, which proceeded from the putrefaction of the mushroom: for, by pecking at these seeds, which are reddish light round bodies, they moved them about with great agility in a variety of directions; while the little animals themselves were scarce visible, till the food they had eaten had discovered them.

"Mr. Needham supposes these little transparent ramified filaments, and jointed or coralloid bodies, which the microscope discovers to us on the surface of most animal and vegetable infusions when they become putrid, to be zoophytes, or branched animals: but to me they appear, after a careful scrutiny with the best glasses, to be of that genus of fungi called *mucor*, or *mouldiness;* many of which Michelius has figured, and Linnæus has accurately described.

"Their vegetation is so amazingly quick, that they may be perceived in the microscrope even to grow and seed under the eye of the observer."

M. Desault, and some others, formerly endeavoured to prove that *all* diseases are owing to animalculæ. But it does not appear that any animal substance contains animalculæ until it becomes putrid, and then these are the effect rather than the cause of diseases. The itch is perhaps the only disease which we can attribute to animalculæ. See Psora.

ANIMATION, the informing an animal body with a soul: the sole act of the Deity. The different hypotheses of physicians and philosophers, concerning the time of animation, have had their influence on the penal laws made against artificial abortions; it having been made capital to procure miscarriage in the one state, while in the other it was only deemed a subordinate crime. The emperor Charles V. by a constitution published in 1532, put the matter on another footing: instead of the distinction of an animated and unanimated fœtus, he introduced that of a vital and non-vital fœtus, as a thing of more obvious and easy decision, and not depending on any system either of creation, traduction, or infusion. Accordingly a fœtus is said, in a legal sense, to be animated, when it is perceived to stir in the womb; which usually happens about the middle of the term of gestation. See Abortion, Pregnancy, &c.

ANIMATION, SUSPENDED. See Drowning and Resuscitation.

ANIME', or GUM ANIME', a resin exsuding from the trunk of a large American tree, called by Piso *jetaiba*, by the Indians *courbaril.* This resin is of a transparent amber colour, a light agreeable smell, and little or no taste. It dissolves entirely, but not very readily, in rectified spirits of wine; the impurities, which are often in large quantity, remaining behind. The Brazilians are said to employ animé in fumigations for pains and aches proceeding from rheumatism. With us it is rarely, if ever, made use of for any medical purposes; but may sometimes be met with in collections of the Materia Medica.

ANIMI DELIQUIUM, (from *animus*, the *mind*, and *delinquo*, to *leave);* swooning or fainting; *lypothymia.* See Syncope.

ANIMUS. This word is to be distinguished from *anima;* the former expresses the faculty of reasoning, and the latter the being in which that faculty resides.

ANI'NGA, a root which grows in the Antilles islands, and is pretty much like the China plant. It is used by sugar-bakers, for refining their sugar.

ANISE or Aniseed. See Anisum.

ANI'SUM, (ανισον; from α, neg. and ισος, *equal); anise*, the *pimpinella anisum* Linn. *Pimpinella, foliis radicalibus trifidis incisis.* Class, *Pentandria.* Order, *Digynia.* See Pimpinella.

ANISUM STELLATUM. See Pimpinella.

ANNOTA'TIO, (from *annoto*, *to mark);* a word used, in the old medical writings, to signify the very beginning or attack of a febrile paroxysm. They have also another *annotatio* or *episemasia*, which they apply to hectic fevers, happening an hour or two after eating.

ANNULAR, *(annularis)*, any thing like a ring: thus, we have the annular bone, &c.

ANNULAR BONE, *(circulus osseus)*, a ring-like bone placed before the cavity of the tympanum in the fœtus.

ANNULAR CARTILAGE. See Cricoid cartilage.

ANNULARIS DIGITUS; the ring finger, or the one situated between the little and middle fingers.

ANNULA'RIS PROCESSUS. See Pons varolii.

A'NNULUS. This is variously applied by phy-

rical writers; Quercetan in his *Med. Hermet.* describes some *Annuli purgatorii;* Libavius treats of *Annuli* as charms against cholics and epilepsies: Scultetus gives this appellation to instruments contrived to hold open the eye, or like parts, in some operations; and Zecchius *De Morbo Gallico* directs an *annulus aureus* to be held in the mouth to draw away the quicksilver that has been used in venereal cures. The *Cricoides* is also called *Annuliformis Cartilago.*

A'NNUS, (from the Hebrew word, SHANAH); the YEAR. The ancients divided the year into winter and summer; their successors divided it into spring, summer, autumn, and winter. It is a system or cycle of several months, usually twelve. A YEAR properly, and, by way of eminence, so called, is the *solar year*, or the space of time, wherein the sun moves through the twelve signs of the ecliptic. This contains 365 days, 5 hours, and 39 minutes, according to the observations of Cassini, and others; but in the civil or popular account, the year only contains 365 days; except every fourth, which contains 366. The vicissitudes of seasons seem to have given rise to the first institution of the year; and these have been observed to produce peculiar effects on the human body. The extremes of temperature in winter, and in summer, commonly produce agues in the spring, and dysenteries in the autumn, in Britain; but in a much greater degree in foreign countries.

A'NO, (ανω) is used for *upwards*, in opposition to κατω, *downwards*, and is often joined by Hippocrates to κοιλια, *venter*, to signify the mouth of the stomach or *Oesophagus.* It is also applied to things which work upwards, as vomits.

ANOCATHAR'TICA, medicines which purge upwards, as emetics.

ANO'DYNA, (ανωδυνα; from α, priv. and ωδυνη, *pain);* anodynes; medicines that ease pain, and procure sleep. They are divided into three sorts, viz.

1. *Paregorics*, παρηγορικα, or such as assuage pain.
2. *Hypnotics*, υπνωτικα, or such as relieve by procuring sleep.
3. *Narcotics*, ναρκωτικα, or such as ease the patient by stupifying him.

Dr. Cullen says it would be difficult to determine whether there be an increased motion in every case of pain; but if so, which he thinks probable, all anodynes are sedatives. But whatever be the case, in this respect, anodynes act first either by diminishing the motion in, or, secondly, by taking off the feeling of, the pained part. Of late, the term anodyne has been confined to medicines which act in this last way, and is therefore commonly understood to be the same with *hypnotica*, or such substances as induce sleep, though it would be proper to make a distinction. *Somnifera* and *soporifera* are the same as *hypnotica*, and all are synonymous to *sedativa*, which also includes *paregorica.*

ANODYNE NECKLACE. See PÆONIA.

ANOMALOUS, an epithet often applied to those diseases whose symptoms do not appear with that regularity generally observed in diseases. A disease is also said to be anomalous, when the symptoms are so varied as not to bring it under the description of any known affection.

ANO'RCHIDES, (ανορχις; from α, priv. and ορχις, the testicle). By the ancient writers, children are so termed which come into the world without testicles. This however, is a very common occurrence; as the testicles of most male infants at the time of birth are within the abdomen. The time of their descent is very uncertain, and instances have occurred where they had not reached the scrotum at the age of ten and fifteen. See GUBERNACULUM.

ANORE'XIA, (from α, priv. and ορεξις, *appetite);* a want of appetite, without loathing of food. Dr. Cullen ranks this genus of disease in the class *locales*, and order *dysorexiæ.* He believes it to be generally symptomatic, but enumerates two species, viz. the *anorexia humoralis* and the *anorexia atonica.*

ANO'SMIA, (ανοσμια; from α, neg. and οζω, *to smell);* a loss of the sense of smelling. All pungent substances, by means of impressions made on the pituitary membrane, act upon the olfactory nerve; and thence arises the perception of odours, which may be destroyed in various ways; from a dryness of the pituitary membrane; its too great mucosity, as in a coryza; its infarction, as in ozæna;—in an obstruction of the nostrils, as in a polypus, and other circumstances. Hence all the species may be reduced to two heads, though Sauvages gives seven, viz. 1st. when it arises from a catarrh; 2d. from an ozæna; 3d. from a polypus; 4th. from venereal affections; 5th. from worms; 6th. from dryness; and 7th, from paralysis. Dr. Cullen correct this genus of disease in the class locales and order dysæsthesiæ; and mentions two species; viz. 1. *Anosmia organica*, when there is some evident fault in the membrane that lines the nostrils, as a catarrh, a polypus, a venereal infection, &c. 2. *Anosmia atonica*, when the membrane of the nostrils has no perceptible imperfection, as in paralysis. In these different instances an attention to the cause will lead to the means for relief.

When the nose abounds with moisture, after gentle evacuations, such things as tend to take off irritation and coagulate the thin sharp serum may be applied; as the oil of anise mixed with fine flour, camphor dissolved in oil of almonds, &c. The vapours of amber, frankincense, gum-mastic, and benjamin, may likewise be received into the nose and mouth. For moistening the mucus when it is too dry, some recommend snuff made of the leaves of marjoram, mixed with the oil of amber, and aniseed; or a sternutatory of calcined white vitriol, twelve grains

of which may be mixed with two ounces of marjoram water, and filtrated. The steam or vapour of vinegar thrown upon hot iron, received up the nostrils, is likewise of use in softening the mucus, opening obstructions, &c.; but, above all, anointing the inside of the nostrils, at bed-time, with hog's lard.

If there be an ulcer in the nose, it ought to be dressed with some emollient ointment, to which, if the pain be very great, a little laudanum may be added. If it be a venereal ulcer, it is not to be cured without mercury. In that case, a solution of the hydrargyrus muriatus in brandy, may be taken. The ulcer ought likewise to be washed with it; and the fumes of cinnabar may be received up the nostrils.

If there be reason to suspect that the nerves which supply the organs of smelling are inert, or want stimulating, volatile salts, stimulating snuffs, and other things which occasion sneezing, may be applied to the nose. The forehead may likewise be anointed with the balsam of Peru, to which may be added camphor, or a little of the oil of amber.

A'NSERES, a genus in the natural system of Linnæus, which term may not improperly be translated water-fowl. Dr. Cullen, in his Materia Medica says, from their nature, the water-fowl are much exercised, and being generally carnivorous, are more alkalescent than the tame; whether they are more so than the wild-fowl, is undetermined. Certain however it is, that, whether from their less alkalescency, or peculiar nature, they are less soluble in the stomach than the latter; so that, if we here apprehend a greater alkalescency, we must likewise suppose a greater viscidity, which indeed they generally possess more than the wild fowl.

Linnæus, using *anseres* for the generical term, uses *anas* for the goose as well as duck. We shall briefly mention the qualities of the following species as aliments:

1. *Anas domestica*, the *tame duck*.—Although different in their manner of living, naturalists commonly have considered the tame and wild animal as the same; but however that may hold in natural history, we must make a difference in their qualities, as food. The wild duck is more alkalescent, more tender, and more easily dissolved than the tame; and, in general, this difference takes place between all wild and tame animals, if they are taken at a suitable age and proper season.—Old animals are generally more alkalescent and more easily soluble than the young: many animals, however, are not viscid when young, so that, in this case, the rule does not obtain. All wild animals, too, differ according to the season, either from the time of their moulting, or the quantity of food they then are able to get.

2. *Anas Moschata*, or *Muscovy duck*.—This bird seems to be of the same qualities with the former, but somewhat of a more firm and less tender texture. When these first were known in England, they were reared with very great care, but are now more neglected.

3. *Querquedula*, or *teale*.—This bird is very much of the nature of the wild duck, and is the most tender and alkalescent, the least viscid and most savory of this genus.

4. *Anser domesticus*, or *tame goose*.—This, though no less alkalescent than the duck, is manifestly less viscid, yet of a firmer texture; its solution, however, is not so constant, depending more on a difference of the powers of the stomach.

Dr. Cullen speaks of the swan, and some other species now very rarely used. The swan, in its young state, is by far the most rigid of any of the order. It is of difficult manducation, and so far as texture can occasion that, it is also of difficult solution in the stomach.

When any of the foregoing species are eaten by the luxurious, and their disposition to excite inconvenience in the stomach apprehended, the remedy is a dose of ardent spirits; a bad means of forcing bad food through the alimentary canal, and tending greatly to the production of diseases.

ANSERI'NA, (from *anser*, a goose; so called, because geese eat it); the herb wild tansey, or goose-grass. It is the *potentilla anserina, foliis pinnatis serratis, caule repente, pedunculis unifloris* Linn. It was formerly used as an astringent, in laxity of the intestines and phthisical complaints, and has also been tried in cancerous affections, but it is now fallen into disuse.

ANTA'CIDA, (from αντι, *against*, and *acidus*, acid); those medicines which have the power of destroying acidity in the primæ viæ. To understand fully the nature of this class of substances, and their medical application, it is of importance to be well acquainted with the facts which relate to the existence of acid acrimony, as it has been called, in the human body.

Dr. Cullen observes, that our bodies are formed, both fluids and solids, from the aliment taken in. No proportion of the animal fluids is of any duration in the system, but constantly washing out, is supplied as regularly again from the aliment. Vegetable food is the only food of animals whose changes we need properly enquire after, as all animals either live directly upon it, or on other animals that do. The acescent matter of vegetables, for it is by that they are chiefly distinguished from animal nature, is converted into animal matter in consequence of powers subsisting in the animal body. Hence, then, vegetable aliment in animal bodies goes through all the steps to putrefaction, which, however, in its highest degree, never takes place in animal bodies. Hence we are led to consider animal fluids in three states; 1. A portion still remaining acescent; 2. A portion in an inter-

mediate state betwixt acescency and putrefaction, or the proper animal fluid ; 3. A portion degenerated towards putrefaction. This view leads us to observe the morbid deviations, while, on the one hand, our food retains too much acescency, or on the other, is gone too far towards putrefaction.

These two acrimonies, the acid and alkaline, are the chief, and perhaps the only ones we can distinctly mark. We may, indeed, perceive extraneous acrimonies introduced by foreign means into the body, but into these it is not necessary at present to enquire. How far even in the common mass there may not be a variety of acrimonies different from those here spoken of, Dr. Cullen will not say ; but he maintains that no one has yet shown of what kind they are, in what cases they will appear, with what symptoms they occur, or what symptoms they produce ; and *de non entibus, ac de non operantibus, fere eadem est ratio*. There is yet a more fruitful source of acrimony in the body, viz. from degenerated fluids being absorbed, and acting upon the system. But to know what acrimonies they would produce, we must be acquainted with the state of all the secreted fluids, a knowledge we are very far from having attained. Every one of them which has been lately examined, has turned out different from what it was formerly imagined, and till once we are well acquainted with their nature, it is in vain to speak of the changes to which they are liable ; so that, though we allow an infinite variety of acrimony, certainly we ought not to talk of them so confidently as we do. Acrimony, in fact, is often accused without foundation. No sooner do we see a motion excited in the system, than we refer it to stimulus, and that stimulus to acrimony ; but we know that every motion of the system can be excited independent of these, as in the hysteric disease, &c. by the passions of the mind. This, indeed, may be thought a stimulus, but surely it is neither of the mechanical nor chemical kind. Acrimony, indeed, does exist, but its species can never be precisely determined ; nay, when it does exist, we may neglect it. In the small pox for instance, and other contagious diseases, an acrimony is certainly present ; but in the cure it gives us no indication, and we do not regard the acrimony itself, but only the effects it produces. In the same manner, in the case of poisons, we obviate their effects, for we very seldom know the nature of the particular poison. Even when we do know them, it is very seldom we can give medicines to correct them. However, there are a few cases where the indication is to expel the morbific matter ; but then this is only a very general way, and by such medicines as bring a total change on the fluids. Upon the whole, it is evident, with what impropriety we amuse ourselves with the idea of existing acrimony, seeing we accuse it so often without foundation, talk of it with so little precision, and may even neglect it with so much safety. Hence Dr. Cullen only treats of the acid and alkaline acrimonies, as with these we are best acquainted, and the first only connected with the use of antacida.

Acid acrimony takes place when the vegetable aliment retains its acid nature to a morbid degree. But in what part of the system does this take place ? In the first stage, in the *primæ viæ*, and almost only in the stomach itself. Some however have supposed, that it goes into the blood, and there occasions diseases. Dr. Cullen is of a contrary opinion. Even in the intestines an acid has never been found, for it is there covered with fluids. As soon as it comes out of the stomach it is mixed with the bile, and forms with it a composition which is the cause of its effects on the intestines. Much less then, he says, can we suppose it in the blood-vessels. He doubts even if the *chyle* be found there, as some alledge, considering the mixture it must undergo in the thoracic duct and in the subclavian vein. All the chyle said to have been seen in the blood is only a portion of the coagulable lymph, separated spontaneously. Even were we to allow it did take place, in twelve hours it would disappear ; for after that time having elapsed from the taking of food, no chyle is secreted, so that we cannot conceive this to have any effect on the consistence or mixture of our fluids. How far a certain modification in the state of our fluids may take place, Dr. Cullen will not say. Vegetable aliment may, indeed, give a less dense blood, but even supposing this, it would by no means be acid. Boerhaave is the chief leader of this doctrine, and, in his *Aphorisms*, talks of an acid milk, &c. produced by it. Yet the very same Boerhaave, in his chemistry, contradicts this opinion, and maintains the contrary against Lemery and Homberg. Nay, he goes to an excess on this subject, and denies an acid could be extracted from human blood, an experiment successfully repeated since Homberg, by every succeeding chemist.

For these reasons Dr. Cullen abstains entirely from the consideration of an acid in the blood-vessels, and talks of it only as existing in the stomach. There, he says, it may take place in two ways ; 1. When the acescent fermentation is of the vinous kind, producing eructations, spasmodic pains, &c. 2. Where, though the fermentation is calm, such a quantity of acid may be generated as to produce bad effects, by uniting with the bile and causing cholera, &c. These however may depend on a variety of causes ; viz. (1.) From an over-proportion of acescent aliment, which may leave so much acid as to prove a ferment for some time afterwards. This cause is much considered, but of a nature easily to be overcome. (2.) From a defect of the digestive liquors, as an abstraction of the saliva, &c. which is not uncommon. (3.) More

frequently still, from a weak stomach; for by the natural healthy action of this organ the aliment is compressed, and the air generated, inviscated and reabsorbed in the formation. Slow evacuation is another consequence of a weak stomach; and indeed this might have made a distinct head, as acidity is always greater in proportion as the aliment is longer detained. Not only is slow evacuation thus hurtful by causing acescency, but also by preventing it from passing into the intestines, and being corrected by mixture with the intestinal fluids.

From all this it appears, that vegetable aliment must be the more acescent, as being less soluble. The weaker action of the stomach deserves particular attention, as that may arise from so many secondary causes, which depend on the constitution of the system in general. These diseases being seldom topical affections, but capable of being produced even by passions of the mind, &c. and augmented by every encreased evacuation of the system, in order to a cure, we must adopt such a treatment as will eradicate these various causes. Here, however, we can only, with propriety consider the application of such medicines as destroy acidity in the first passages.

The analysis of the urinary calculus by *Scheele* and *Bergman*, has taught us that this concretion is formed by an acid; and *Boerhaave's* experiments show, that a matter fit to form such a secretion is constantly present in the most healthy urine, and capable of forming such a concretion whenever a matter favourable to its accretion is presented to it. All this shows, that the acid often copiously taken in, is not entirely destroyed in the course of the circulation, but subsists, and is carried to the remotest passages. We cannot say what are the means of determining the different qualities of calculous matter at different times present in the urine; what are the various circumstances that determine its concretions; and particularly what are the causes of the uneasiness and pains that arise from calculi formed: Dr. Cullen deems this a very difficult subject. We must therefore be satisfied with observing, what experience has shown, that antacid and alkaline substances are what have given the most certain relief in many cases of urinary calculus.

It has been long the opinion of the unlearned in medicine, and even of some physicians, that the relief obtained in such cases was produced by the alkaline medicines dissolving the concretions that had been formed in the kidneys or bladder; and from hence they have the name of SOLVENTS. It is not even yet, absolutely determined whether they ever do this or not. Dr. Cullen is of opinion that they do not; but allows it to be proper to employ them wherever they conveniently can be administered. "In the mean time," says he, "it is enough for me to remark, that it is now sufficiently certain, that alkalines do not always dissolve the stones in the urinary passages; but, in many cases, without dissolving the calculi, they certainly relieve the pain and uneasiness which the presence of the calculus occasions; and therefore, upon every supposition, their employment is proper."

The particular antacids, enumerated by Dr. Cullen are numerous. See MATERIA MEDICA. It is necessary here only to take notice of the more particular kinds.

1. *Chalk.*—This, and the several testacea, he says, are much of the same nature, and are especially fitted for correcting the acidities of the primæ viæ, and for that purpose may be used in large quantities. Some have imagined, that, on their being joined with the acid of the stomach, they become astringent; but if it ever does happen, it is a rare occurrence. These earths sometimes seem to be of service in diarrhœas; but Dr. Cullen imputes this not to their astringent quality, but merely to their correcting acidity, which, by being mixed with the bile, had occasioned the bowels to be out of order.

2. *Corallium* and the *corallina* were formerly in repute as alkaline and absorbent earths; but the present practice neglects them as unnecessary, or at least not superior to substances which may be had at a much cheaper rate.

3. *Cornu cervi ustum* is still retained by the London College; but it is the weakest of all the absorbents, and has not any peculiar virtues, to entitle it to the place assigned it.

4. *Magnesia*, though often employed as an absorbent, does not differ in its chemical qualities from the preceding. In its medical properties however, it differs from all the others, as, when joined with a vegetable acid, such as it commonly meets with in the human stomach, it proves laxative, operating much in the same manner, though not so strongly, as the vitriolated magnesia.

The substances abovementioned are chiefly used for correcting the acidities of the stomach, and have not been commonly employed in the cases of calculi as mentioned above, though, upon Dr. Cullen's theory, they might be, and sometimes he says, have been, with advantage. The objection to them in this view is, that they cannot be conveniently employed in such quantity as to absorb so much acid as seems necessary to give material relief in calculous cases. It has therefore been found necessary to have recourse to the alkaline salts, and to the impregnation of water with *lime*. This last, when taken in large quantity, has proved to be sufficient for the purpose: and with respect to it, Dr. Cullen remarks, that from many trials, lime-water made from the common lime-stone is equally effectual, and generally more agreeable than that made from any of the testacea submitted to calcination in the same way.

ANTAGONIST MUSCLES, (*musculi antagonisti;* from αντι, against, and αγωνιζω, to strive). Those muscles are so called, which act in opposition to other muscles.

ANTA'LGICA, (ανλαλγικα; from ανλι, *against*, and αλγος, *pain);* those remedies which ease pain, such as narcotic substances, &c.

ANTA'LIUM, (from αντα, *before*, and αλς, *the sea);* also called *antale* and *tubulus marinus;* a shell like a pipe, of the thickness of a small quill, and about an inch and a half in length; hollow, and having indented lines running from one end to the other. Its colour is white. A kind of worm is the natural inhabitant of this shell, the medical properties of which are the same with the shells of oysters, &c. but it has long fallen into disuse.

ANTALKALI'NA, (from *anti*, *against*, and *alkali*, an *alkali);* medicines which possess the power of neutralizing alkalis. In his Lectures on the Materia Medica, Dr. Cullen inserts a chapter on the ANTALKALINA, chiefly he says out of complaisance to the celebrated Boerhaave, who has written "*de Morbis ex Alkali spontaneo.*" He is however well persuaded, that no alkaline salt, in its separate state, ever exists in the blood-vessels of the living human body; that this doctrine of Boerhaave, is, in almost every part of it, incorrect and erroneous, and consequently that there is no occasion for the use of antalkaline remedies in the way he proposes. The only occurrence that can require them is a very rare one; viz. that of a pure alkali being taken in, by mistake or accident, into the stomach. The means of taking off its irritation by neutralizing with the acids is sufficiently obvious; only it is to be remarked, that as the alkali, in any noxious quantity, cannot probably be introduced without excoriating the mouth, fauces, and œsophagus; so it is always necessary, in such cases, along with the acids, to employ diluents and demulcents very copiously.

ANTARTHRI'TICA, (from αντι, *against*, and αρθριτις, *the gout);* medicines supposed to be effectual against the gout.

ANTASTHMA'TICA, (from αντι, *against*, and ασθμα, *an asthma);* remedies against an asthma.

ANTELA'BIA, (*ante*, before, and *labium*, a lip); the extremities of the lips.

ANTE'LIX, OR ANTHE'LIX, (from αντι, *opposite*, and ελιξ, *the helix);* that part of the ear which is opposite to the helix. See HELIX.

ANTE'RIOR AURIS MUSCULUS; one of the common muscles of the ear, situated anterior to the external ear. It arises, thin and membranous, near the posterior part of the *zygoma*, and is inserted into a small eminence on the back of the helix, opposite to the concha, which it draws a little forwards and also upwards.

ANTERIOR INTERCOSTALIS: a nerve so called is the *splenic nerve;* a branch of the great intercostal nerve that is given off in the thorax.

ANTERIOR MALLEI MUSCULUS. See LAXATOR TYMPANI.

ANTHE'A, (from ανθος, *a flower)*, in the plural signifies *redness*, like the top of a carbuncle. This term occurs in the latin works of some of the old writers.

ANTHE'LIX. See ANTELIX.

ANTHE'LMIA, (from αντι, *against*, and ελμινθος, *a worm);* also called *spigelia*, and *caryophillus Indicus; Indian pink*, the *worm-grass* of Jamaica. It is the SPIGELIA MARILANDICA, vel *spigelia caule tetragono, foliis omnibus oppositis* Linn. Syst. Nat. 166. vel *spigelia anthelmia* Linn. Class, *Pentandria.* Order, *Monogynia.* It is called Spigelia by LINNÆUS, in honour of the Botanist *Spigelius*, who first described it.

This plant is found in different parts of the island of Jamaica, and other of the windward-islands. It rises from a small tapering root, well charged with fibres on all sides, by a straight, smooth, roundish, and hollow stalk, which seems to grow thicker as it rises to the height of five, seven, or nine inches: at the top are generally four leaves, oblong, sharp-pointed, and almost equal; with veins, which, running obliquely towards the sides or edges of the leaf, turn off and terminate towards the point: out of the centre of the cross, formed by these four leaves, rise one, two, or more spikes, bearing flowers; which spikes are from half an inch to two or three inches long, and range the flowers and seeds on one side of them pretty thick: the mother-stalk has generally one, two, or three joints, out of which spring twice as many leaves opposite, and like those at the top, and as many branches in an alternate order, which terminate like the mother-stalk.

The usual method of administering this medicine is shewn under the article ANTHELMINTICA.

ANTHELMI'NTICA, (ανθηλμινλικα; from ανλι, *against*, and ελμινθος, *a worm); anthelmintics;* medicines which procure the evacuation of worms from the human stomach and intestines.

There is no complaint more frequent among children than that of worms, the general symptoms of which we shall presently enumerate; but it must be observed, that all the ill effects commonly attributed to worms alone may be produced by a foulness of the bowels. Hence practitioners ought never to rest satisfied with administering to their patients such medicines as are possessed only of an anthelmintic quality, but to join them with those which are particularly adapted for cleansing the primæ viæ; as it is uncertain whether a foulness of the bowels may not be the cause of all the patient's complaints. This practice is still the more advisable, on account of viscid matters in the intestines

affording lodgment to the ova of worms; which, without the conveniencc of such a receptacle, would be more speedily discharged from the body.

The worms that infest the human body are chiefly of three kinds: viz.

1. The ASCARIDES, or small round and short white worms.

2. The TERES, or round and long worm.

3. The TÆNIA, or *tape-worm.*

Children are most subject to the two former, though sometimes also to the latter.

The ascarides have usually their seat in the rectum.—The teretes or lumbrici are about a span long, round and smooth: they are seated for the most part in the upper small intestines: but sometimes they are lodged in the stomach, and in any part of the intestines, even to the rectum — The tape-worms are from two to forty feet long, according to the testimony of Platerus. See TÆNIA. They generally possess the whole tract of the intestines, but especially the ilium: they very much resemble tape in their appearance, whence the name of tape-worm; but another species of this genus, from the resemblance of each joint to a gourd-seed, has the name of the gourd-worm.

In the Medical Transactions, vol. I. Dr. Heberden gives a very accurate account of the symptoms produced by the ascarides, from an eminent physician who was troubled with them all his life. They brought on an uneasiness in the rectum, and an almost intolerable itching in the anus; which sensations most usually came on in the evening, and prevented sleep for several hours. They were attended with heat, sometimes so considerable as to produce a swelling in the rectum both internally and externally; and if these symptoms were not soon relieved, a tenesmus was brought on, with a mucous dejection. Sometimes there was a griping pain in the lower part of the abdomen, a little above the os pubis. If this pain was very severe, a bloody mucus followed, in which there were often found ascarides alive. They were also sometimes suspected of occasioning disturbed sleep, and some degree of head-ach.

On this case Dr. Heberden observes, that the general health of the patient did not seem to have suffered from the long continuance of the disease, nor the immediate inconveniences of the disorder itself to have increased. "It is," says he, "perhaps universally true, that this kind of worms, though as difficult to be cured as any, yet is the least dangerous of all. They have been known to accompany a person through the whole of a long life, without any reason to suspect that they hastened its end. As in this case there was no remarkable sickness, indigestion, giddiness, pain of the stomach, nor itching of the nose, possibly these symptoms, where they have happened to be joined with the ascarides, did not properly belong to them, but arose from some other causes. There is indeed no one sign of these worms, but what in some patients will be wanting."

The abovementioned patient used purging and irritating clysters with very little success. One drachm and a half of tobacco was infused in six ounces of boiling water; and the strained liquor being given as a clyster, occasioned a violent pain in the lower part of the abdomen, with faintness and a cold sweat: this injection, though retained only one minute, acted as a smart purge, but did little or no good. Lime-water was also used as a clyster; which brought on a costiveness, but had no good effect. Six grains of salt of steel were dissolved in six ounces of water, and injected. This clyster in a few minutes occasioned an aching in the rectum, griped a little without purging, and excited a tenesmus. Some few ascarides were brought off with it; but all of them were alive. The uneasy sensation in the rectum did not abate till some warm milk was thrown up. Whenever the tenesmus or mucous stools were thought worth the taking notice of, warm milk and oil generally gave immediate relief. If purging was necessary, the lenient purges, such as manna with oil, were, in this particular case, made use of: rhubarb was found too stimulating. But, in general, the most useful purge, and which therefore was most usually taken, was cinnabar and rhubarb, of each half a drachm: this powder seldom failed to bring away a mucus as transparent as the white of an egg; and in this, many ascarides were moving about. The cinnabar frequently adhered to this mucus, which did not come off in large quantities, when a purge was taken without cinnabar. Calomel did no more than any other purge which operates briskly would have done; that is, it brought away ascarides, with a great deal of mucus. Oil given as a clyster sometimes brought off these animalcules: the oil swam on the surface of the mucus, and the ascarides were alive and moving in the mucus itself, which probably hindered the oil from coming in contact with them and killing them.

The doctor also observes, that mucus or slime is the proper nest of the ascarides, in which they live, and is perhaps the food by which they are nourished; and it is this mucus which preserves them unhurt, though surrounded with many other liquors, the immediate touch of which would be fatal. It is hard to satisfy ourselves by what instinct they find it out in the human body, and by what means they get at it; but it is observable in many other parts of nature, as well as here, that where there exists a fit soil for the hatching and growth of animals and vegetables, nature has taken sufficient care that their seeds should find the way thither. Worms are said to have been found in the intestines of infants born dead. Purges, by lessening this slime, never fail to relieve the patient: and

it is not unlikely, that the worms which are not forced away by this quickened motion of the intestines, may, for want of a proper quantity of it, languish, and at last die; for if the ascarides are taken out of their mucus, and exposed to the open air, they become motionless, and apparently die in a very short time. Dr. Heberden supposes that the kind of purge made use of is of some consequence in the cure of all other worms as well as ascarides; the animals being always defended by the mucus from the immediate action of medicines; and that therefore those purges are the best which act briskly, and of which a repetition can be most easily borne. Purging waters are of this sort, and jalap especially for children; two or more grains of which, mixed with sugar, are most easily taken, and may be repeated daily.

From the case abovementioned, and from Dr. Heberden's observations, we may easily see why it is so difficult to destroy these animals: and why anthelmintics, greatly celebrated for some cures, are yet so far from being specifics in the disease. As the worms which reside in the cavities of the human body are never exposed to the air, by which all living creatures are invigorated, it is evident, that in themselves they must be the most tender and easily destructible creatures imaginable, and much less will be requisite to kill them than any of our common insects. The most pernicious substances to any of the common insects are oil, caustic fixed alkali, lime, and lime-water. The oil operates upon them by shutting up the pores of their bodies; the lime-water, lime, and caustic alkali, by dissolving their very substance. In the case of intestinal worms, however, the oil can have very little effect upon them, as they are defended from it by the moisture and mucus of the intestines; the like happens with lime-water: and therefore it is necessary that the medicine should be of such a nature as to destroy both mucus and insects together; for which purpose the caustic fixed alkali is at once safe and efficacious; nor is it probable that any case of worms whatever could resist the proper use of this medicine. A very large dose of any salt indeed will also destroy the mucus and destroy the worms; but it is apt to inflame and excoriate the stomach and intestines, and thus to produce worse disorders than that which it was intended to cure.

Dr. Heberden gives the following remarkable case of a patient cured of worms by enormous doses of common salt, after trying many other remedies in vain. In February, 1767, the patient was seized with uncommon pains in his stomach, attended with nausea, vomiting, and constipation of the bowels, and an almost total loss of sleep and appetite: he soon became emaciated, and could neither stand nor walk upright; his belly grew small and hard, and closely retracted, insomuch that the sternum covered the navel, and the latter could scarcely be discovered or felt by the finger: his urine was always milky, and soon deposited a thick white sediment; his excrements were very hard and lumpy, resembling those of sheep, only of a brown colour; nor had he ever a stool without some medicine or other to procure it. In this situation he continued four years; during which time he had been in an infirmary, attended by eminent physicians, but was dismissed as incurable. At last he was advised by a neighbour to drink salt and water, as he said he knew one cured by it who had for many years been afflicted with the same kind of pains in the belly and stomach. As his disorder was now almost insupportable, he willingly tried the experiment. Two pounds of common salt were dissolved in as little water as possible, all which he drank in less than an hour. Soon afterwards he found himself greatly oppressed at the stomach, grew extremely sick, and vomited violently; on the fourth straining he brought up about half a pint of small worms, part ascarides, and the rest resembling those worms which are called the botts, and frequently met with in the stomachs of horses, but much smaller, about the size only of a grain of wheat. The salt soon began to operate downwards, and he had five or six very copious fetid stools, tinged with blood; and in them discharged near an equal quantity of the same kind of worms he had vomited. Being greatly fatigued with the violence of the operations, he fell into a calm sleep, which lasted two hours, during which he sweated profusely, and awoke much refreshed. Instead of his usual pains, he now only complained of a rawness and soreness of his gullet, stomach, and bowels, with an almost unquenchable thirst; to allay which, he drank large quantities of cold water, whey, butter-milk, or whatever he could get. The urine he now passed was small in quantity, and rendered with very great difficulty, being highly saturated with the salt, from whence arose a most troublesome dysuria and strangury. However, these symptoms gradually abated by a free use of the liquors abovementioned; and on the third morning he was so well recovered, that he took two pounds more of salt, dissolved in the like quantity of water. The effects were nearly similar to the former: only that most of the worms were now burst, and came away with a considera- quantity of slime and mucus. The drought, strangury, &c. returned with their former violence, but soon yielded to the old treatment. He sweated very copiously for three days, slept easily, and by that time could extend his body freely: on the fifth day he left his bed, and, though very weak, could walk upright; his strength and appetite soon returned, and he became robust and well.

The ANTHELMINTIC MEDICINES which have been recommended by one person or other are in a manner innumerable; but the principal are,

(1) *Quicksilver.*—This is very efficacious against all worms, either taken in the form of calomel or corrosive sublimate. Even the crude metal boiled in water and the water drunk, has been recommended as an almost certain cure. But this, it is evident, can receive little impregnation from the mercury. If, therefore, it have any effect, it must be from some foreign and accidental impregnation. In most instances there can be no objection to mercury, but only that it is not endowed with any attenuating quality whereby the mucus in which these insects reside can be dissolved. It therefore fails in many cases, though it will most certainly destroy worms where it can get at them.

(2) *Granulated tin.*—This was for some time celebrated as a specific, and indeed we may reasonably expect good effects from it: as, by its weight and grittiness, it rubs off the mucus, and worms it contains, from the coats of the intestinal canal, in which case they are easily evacuated by purgatives. In order to produce any considerable effects, it must be given in a large dose.

(3) *Geoffræa-inermis, or cabbage bark.*—This remedy is used by the Inhabitants of Jamaica. The first account of it which appeared in this country was published in the Physical and Literary Essays, vol. II. by Mr. Duguid, surgeon in that island. He acquaints us, that the inhabitants of Jamaica, young and old, white and black, are much infested with worms, especially the long round sort; the reason of which, he thinks, is the quantity of sweet viscid vegetables which they eat. On dissecting a child of seven months old, who died of vomiting and convulsions, twelve large worms were found; one of them filled the appendix vermiformis, and three of them were entwisted in such a manner as to block up the valvula Tulpii, so that nothing could pass from the small to the great guts.—The cabbage bark, however, he tells us, is a safe and effectual remedy, and the most powerful vermifuge yet known; and that it frequently brings away as many worms by stool as would fill a large hat. He owns that it has sometimes violent effects; but this he ascribes to the negroes who make the decoction (in which form the bark is used), and not to the remedy itself.

Mr. Anderson, surgeon in Edinburgh, has also given an account of this bark and its operation, in a letter to Dr. Duncan, published in the Edinburgh Medical Commentaries, vol. IV. p. 84. From this account it appears, that there are two different kinds of bark; the one much paler than the other: the pale kind operates much more violently than the other. It often occasions loose stools, great nausea, and such-like symptoms, attended with great uneasiness in the belly: in one or two instances it was suspected of inducing syncope. The darker coloured kind resembles the cassia lignea, though it is of much coarser texture. This kind, Mr. Anderson thinks, may be exhibited in any case where an anthelmintic is necessary; the dangerous symptoms might have followed either from the use of the first kind, or from an overdose of the second. The usual method of preparing the medicine is by boiling two ounces and a half of the bark in two quarts of water to a pint and a half. Of this a tea-spoonful may be given at first in the morning, gradually increasing the quantity till we come to four or five table-spoonfuls in a day. When exhibited in this manner, Mr. Anderson informs us, that he never saw it produce any violent symptoms, and has experienced the best effects from it as an anthelmintic. After the use of this decoction for eight or nine mornings successively, a dose of jalap with calomel must be given, which seldom fails to bring away the worms, some dead, some alive. If at any time the decoction produce more than one or two loose stools, a few drops of tincture of opium may be given; and, in general, Mr. Anderson gave 15 or 20 drops of the spirit of lavender with each dose.

In a letter from Dr. Rush, professor of chemistry at Philadelphia, to Dr. Duncan of Edinburgh, the following account is given of another preparation of this medicine. "It has long," says he, "been a complaint among physicians, that we have no vermifuge medicine which can be depended upon. Even calomel fails in many cases where there are the most pathognomonic signs of worms in the bowels. But this complaint, it is hoped, is now at an end. The physicians of Jamaica have lately found that the cabbage bark, as it is called in the West Indies, made into a syrup with brown sugar, is an infallible antidote to them. I have used above 30 pounds of it, and have never found it fail in one instance. The syrup is pleasant; it sometimes pukes, and always purges the first or second time it is given."

Notwithstanding these great encomiums, however, the cabbage bark has not come into general use in Britain. But diseases from the teretes, or lumbrici, as they are often called, the species of worm against which this bark is employed, much less frequently occur here than in some other countries. When they do occur, in almost every instance they readily yield to more gentle and safe anthelmintics; and the worms may not only be expelled by calomel, but by the vegetable bitters; as the powder of the semen santonicum, or the like.

(4) *Couhage* or *cow-itch.*—This is the *dolichos urens* or *pruriens* of Linnæus; and the principles on which it acts are of a mechanical kind. It is somewhat similar to the powder of tin, but has been reckoned much more efficacious. It might at first appear to occur as an objection to this medicine, that, by the hairs of it entangling themselves with one another, calculi might be formed in the intes-

tines, or obstructions equally bad; or if the sharp points and hooks with which it abounds were to adhere to the nervous coats of the intestines themselves, they might occasion a fatal irritation, which could not be removed by any means whatever. But from the experience of those who have employed it extensively in practice, it would appear that these objections are entirely theoretical; and that it may be employed with perfect safety. The spiculæ, gently scraped off from a single pod, and mixed with syrup or melasses, are taken for a dose in the morning fasting. It is repeated in this manner for two or three days without any sensible operation; but even a very slight purgative taken afterwards has been found to discharge an almost incredible quantity of worms. And according to Dr. Bancroft, who has given a very particular account of its use in his Natural History of Guiana, it is one of the safest and most certain anthelmintics yet discovered; but, as well as the bark of the Geoffræa, it has hitherto been véry little used in Britain, probably from its not being wanted.

Dr. Saunders, Physician to Guy's Hospital, in London, gives this medicine in the following way:

℞ Dolich. pub. rigid. (Pharm. Edin.) ʒj;
Syr. simp. q. s. ut fiat electuarium.
Capiat cochlearium minimum, singulis auroris, ad tertiam usque vicem.

(5) *Anthelmia, Indian pink.*—This plant, which is the *spigelia marilandica* of Linnæus, is also an American plant, and was first recommended in the Edinburgh Physical and Literary Essays by Dr. Garden, of Charlestown, in South Carolina. He is of opinion that a vomit ought always to precede the use of it; and informs us, that half a drachm of it purges as briskly as the same quantity of rhubarb. At other times he has known it produce no effect on the belly, though given in very large quantity: in such cases it becomes necessary to add a grain or two of calomel, or some grains of rhubarb; but then it is less efficacious than when it proves purgative without addition. The use of it, however, in small doses, is by no means safe; as it frequently produces giddiness, dimness of sight, convulsions, &c. The addition of a purgative, indeed, prevents these effects; but at the same time, as already observed, it diminishes the virtue of the medicine. The doctor therefore recommends large doses, as from them he never knew any other effect than the medicine's proving emetic or violently cathartic. The dose is from 12 to 60 or 70 grains of the root in substance, or two, three, or four drachms of the infusion, twice a-day.

In the Medical and Physical Journal, Dr. Barton, who writes on the spigelia, says, "In some parts of Carolina, &c. this invaluable plant is known, among other appellations, by the name of snake-root. It is the *unsteetla* of the Cherokee Indians. Every part of the plant is possessed of the anthelmintic property, and accordingly, in Carolina, the physicians employ the whole plant—chiefly in decoction. But the active power unquestionably resides more especially in the roots. It is the opinion of many persons, that the deleterious effects which occasionally occur from using this vegetable do not arise from any pernicious property inherent in the spigelia, but from the root of a distinct plant which is often mixed with the spigelia. I do not think this notion is entitled to any serious attention. The spigelia is, without doubt, a poisonous and narcotic vegetable. It is, in all probability, by virtue of this poisonous quality, that it proves so beneficial in cases of worms. I am acquainted with a very intelligent physician, who, in the exhibition of the spigelia, always deems it necessary, or proper, to persevere in the use of the medicine until it produces some very decided effect upon the brain. I must confess, however, that I have often found it completely efficacious, without observing that it has ever occasioned the least inconvenience to the system. That it has sometimes done mischief, will not, I believe, be denied. Professor Bergius informs us, that he has known instances of convulsions cured by the spigelia, although no worms were expelled by it. Dr. Garden, speaking of this plant, says, 'It especially answers in continued or remitting low worm-fevers, in which I use its decoction, adding a small proportion of the root of the serpentaria Virgin. Its effects in abating the feverish exacerbations are so considerable, that in these I consider it as the most powerful sedative. It is an excellent attenuant.' I have been induced to take notice, in this place, of the observations of Bergius and Garden, because a pretty extensive use of the spigelia has now convinced me that this medicine very often affords relief, and, indeed, effects a cure, in cases in which worms are supposed to be present, but in which none are discharged. If I do not greatly mistake, this will be found an highly useful medicine in some of the febrile diseases of children, unaccompanied by worms, especially in the insidious remittent, which so frequently lays the foundation of dropsy of the brain."

(6.) *Nicotiana, common tobacco.*—Dr. Barton says there is a peculiar mode of employing the leaves of tobacco, in cases of worms, which has, in many instances, produced very happy effects. The leaves are pounded with vinegar, and applied, in the shape of a poultice, to the region of the stomach, or other part of the abdomen. In consequence of this application, worms are often discharged, after powerful anthelmintics have been exhibited internally in vain. He says, we ought not to be surprised at this effect of the tobacco, since we know that the same vegetable, applied ex-

ternally, is often very efficacious in inducing vomiting. Accordingly, the doctor has for some years been in the habit of applying tobacco leaves to the region of the stomach of persons who have swallowed large quantities of opium, and other similar articles, with the view to destroy themselves. It is well known, that in these cases the stomach is often extremely inirritable; insomuch that the most powerful emetics have little effect in rousing that organ into action.

(7.) *Melia Azedarach, pride of India.*—This, which is called in South-Carolina *poison-berry-tree* and *China-tree*, is another remedy mentioned by Dr. Barton. "When I published the first edition of my collections," says he, "I had not any experience in the use of this vegetable. Since that period, however, I have used it in several cases of worms, and always with advantage. Indeed, I am inclined to think, that the character of this new anthelmintic has not been too highly drawn. I will not assert that it ought to be preferred to the spigelia; for I have had much more to do with this than with the melia. The melia is unquestionably a valuable anthelmintic, and ought to be introduced into general practice. I have employed the bark of the root, both in substance and in the shape of a saturated decoction. In the case of an adult, who took the decoction in large quantities, with the effect of discharging great numbers of worms, it seemed to occasion some confusion of the head, and trembling of the hands. These, perhaps, were accidental symptoms; but I am disposed, with the patient, to ascribe them to the medicine. The worm cases in which I have found the melia useful, were cases of the common round worm, or lumbricus intestinalis. I have not had any opportunity of trying how far it is a remedy against the tænia, or tape-worm. But I am informed that, in Carolina, it has been used with the effect of discharging great numbers of this species of worm. Should this prove to be the case, the melia will be doubly entitled to our attention as an article of the materia medica. It is not merely in cases of worms that this vegetable has been found useful. Mr. Andrew Michaux, an intrepid French botanist, informed me, that in Persia, where this tree grows spontaneously, the pulp which invests the stone of the fruit is pounded with tallow, and used as an 'antipsoric,' in cases of tinea capitis in children.

"Is the melia a narcotic or poisonous vegetable? Its remarkable effects in destroying or dislodging worms renders this probable, but not certain; for many articles which, with respect to the human body, are entirely innocent, are known to be noxious to intestinal worms, and many other animals. Such is sugar, as has been demonstrated by the experiments of Redi, Carminati, and other writers. The case which I have alluded to renders the deleterious quality of this vegetable very probable. I may add, that, in some parts of Carolina, the root is deemed poisonous."

Many of these medicines have had their day, and are now very far from being considered as specifics. From what has been already observed, it must clearly appear, that powder of tin, cowage, or fixed alkaline salts, bid fairest for destroying worms in all the variety of cases in which they can occur. Alkalies, indeed, have been but little tried. We have known one case in which all the complaints have been removed by a single dose: we have also an instance of their efficacy, in an extraordinary case of a worm bred in the liver, mentioned in the second volume of the Medical Observations. The patient had a violent pain in the side, and sometimes in the shoulder, as the worm shifted its place: but, on the application of a lixivial poultice, the pain went out of the side entirely, and kept in the shoulder for some weeks.

The long round worms seem to be the most dangerous which infest the human body, as they have been known to pierce through the stomach and intestines, and thus occasion death. The common symptoms of them are nausea, vomiting, looseness, fainting, slender intermitting pulse, itching of the nose, and epileptic fits. By the consumption of the chyle, they produce hunger, paleness, weakness, costiveness, tumor of the abdomen, eructations, and rumbling of the intestines; but it is from the perforation of the intestines only that the disease sometimes proves fatal. A child may be known to have worms from its cold temperament, paleness of the countenance, livid eye-lids, hollow eyes, itching of the nose, voracity, startings, and grinding of the teeth in sleep; and more especially by a very fetid breath. Very frequently, however, they are voided by the mouth and anus, in which case there is no room for doubt.

Dr. Hugh Smith considers the most efficacious anthelmintics to be tin and its preparations; mercurials, vitriolated iron, and sweet oil. He directs the following to be used according to circumstances:

℞ Limatur. stanni, ʒj. ad ʒiij.
Capiat mane et vesp. ex theriac. com. melle vel quovis alio vehiculo.

℞ Auri musivi, ℈ij. ad ʒij.
Sumat bis die ex quovis vehiculo.

It may be necessary, he observes, during the use of the above preparations, to administer once in six or seven days a mercurial cathartic.

Amongst the different prepartions of mercury, the hydrargyrus cum sulphure claims the preference with many practioners.

℞ Hydrarg. cum sulph. ℥j.
Pulv. Rhabarb. ʒj.
M. ft. pulv.—Dos. ʒj. ad ʒjss. bis die.

℞ Ferr. vitriolat. ʒjss. Solve in
Aq. cinnam.
Aq. distill. aa ℔ss.
Dos. ℥ij. ad ℥iv. mane et vespere.

℞ Ol. amygd. dulc.
Aq. fontan. aa ℥ij.
M. ft. Haust. omni mane jejun. ventriculo sumend.

The doctor also directs oil to be injected to the extent of ℥viij. glysterwise; which, he says, will greatly tend to the destruction of the ascarides, whose seat is principally confined to the rectum.

To the foregoing, we will add the methods recommended by Dr. Temple; who says, the long round worm and short flat worm may generally be removed by some of the following medicines:

℞ Pulv. spigel. Maryland. gr. x.
Capiat mane et vespere in theriaca vel quovis idoneo vehiculo.

The above is proper for a child of eight years of age; but an adult may take half a drachm for a dose. A child of eight years old may also take,

℞ Pulv. rhab. gr. x.
Aloes socotorin. gr. j.
Calomel ppt. gr. ij.
M. f. pulv. mane primo sumend.

Or,

℞ Rasur. stanni,
Cons. absinth. aa ℥ſs.
Syr. Zingiber. q. f.
M. f. elect. capt. ʒj. omni mane.

Or,

℞ Siliquæ Hirsutæ q. v.
Theriac. com. q. s.
M. f. elect. capt. cochl. j. minim. mane primo per dies tres, et postea dos. rhab.

The ascarides, he observes, are generally seated within the anus, and may be dislodged by some of the following means:

℞ Fol. absinth.
Fol. rutæ aa ℥j. coque in q. s.
Aq. puræ ad colat. ℥x.
Ol. olivæ ℥ij. M. f. enema.

Or,

℞ Aq. calc. tepid. ℥xij. pro enemate.

Or,

℞ Decoct. pro enemat. ℥vj.
Aloes j
Solve et fiat enema.

In the Medical Commentaries, vol. ii. we have an account of the intestines being perforated by a worm, and yet the patient recovered. The patient was a woman, troubled with an inflammation in the lower part of the abdomen. The pain was so violent, that for six days she slept none at all; the tumor then broke, discharged upwards of a pound of thin watery sanies, immediately after which the excrements followed. The next day she was extremely low; her pulse could scarcely be felt; the extremities were cold; and there was a considerable discharge from the wound, which had already begun to mortify. She got a decoction of the bark with wine, which alleviated the symptoms; but, in removing the mortified parts, a worm was found among them nine inches long, and as thick as an eagle's quill. By proper applications, the discharge of excrements ceased, and she recovered perfect health. She was sensible of no accident giving rise to the inflammation; so that, in all probability, it arose entirely from the worm itself.

The tænia, or tape-worm, as it is called, is one of those most difficult to be removed from the human body. It is of two kinds, the tænia solium, and the tænia lata; which are described by naturalists. The reason of its being so difficult to expel is, that, though portions of it are apt to break off and be discharged, it is endowed with a power of reproduction, so that the patient is little or nothing better. The symptoms occasioned by it, and the peculiar methods by which it is expelled, are described under the article Tænia.

ANTH'EMIS COTULA, (*cotula*, a dim. of *cos*, a whetstone; so called from its leaves resembling a whetstone); the systematic name for the plant called *cotula fœtida* in the dispensatories. See Cotula Fœtida.

ANTH'EMIS NOBILIS, (*anthemis*, ανθεμις; from ανθος, a *flower*); the systematic name for the *chamomile* of the shops. See Chamœmelum.

ANTH'EMIS PYRETHRUM; a plant is so called from which is obtained the pyrethrum of the pharmacopœias. See Pyrethrum.

A'NTHERA, also ANTERA, (from ανθος, a *flower*); a compound medicine used by the ancients, so called from its florid red colour. There are various compositions which had this name. Antheræ, indeed, were prepared for any particular part of the body, in the form of powders, electuaries, &c. and were used as collyriums, dentifrices, &c.

A'NTHERA, (ανθηρα, from ανθος, a *flower*); in the Linnæan system, is that part of the stamen of the flower which contains within it the pollen, and, when come to maturity, discharges the same upon the *pistil*, or female part.

ANTHOPHY'LLI, (ανθοφυλλον; from ανθος, a *flower*, and φυλλον, a *leaf*); so called from the fragrance of the flowers and the beauty of the

leaves. Cloves are so termed when they have been suffered to grow to maturity. See CARYOPHILLUS.

ANTH'ORA, or ANTITH'ORA, (from αντι, *against*, and θωρα, *monk's-hood)*, so called because it is said to counteract the effects of the *thora*, or *monk's-hood;* called also *aconitum salutiferum*, *wholesome wolf's-bane*. It is the *aconitum anthora* Linn.

This plant is distinguished from the poisonous aconites, by the leaves not being glossy, by their being cut entirely down to the pedicle, and by the segments being very narrow, and of nearly the same width from end to end. It is a native of the Alps and Pyrenees, from whence we have the dried roots, which are of an irregular roundish shape, a little oblong, brown on the outside, white within, hard to break, but not tough; to the taste it is acrid and bitter, to the smell it is faint; if chewed, it a little constringes the fauces, and a nauseous sweetness is perceived. It is supposed to be an antidote to the poisonous aconites, particularly to that species called *thora*, whence its name *anti-thora*.

A'NTHOS, (ανθος, from ανω, *upwards*, and θεω, *to run*, because in its growth it runs upwards), a *flower*. Hippocrates means by this word, flowers in general; and, if Galen is right in his comment, Hippocrates includes the seeds with the flowers. It is also used for *æris flos*. This term, when used alone, signifies the flowers of rosemary: it is sometimes taken to signify the plant, but improperly. See ROSMARINUS.

A'NTHRAX, *(anthrax*, from ανθραξ, a *burning coal)*, otherwise named *carbunculus;* a hard, circumscribed, inflammatory tubercle, which sometimes forms on the body, and in a few days becomes highly gangrenous.

A trifling distinction has been made between this and the *carbuncle; anthrax* being described as having more prominence, penetrating deeper into the adipose membrane, and occasioning a higher degree of pain and inflammation; but there is not the least reason for this.

Dr. Cullen places carbuncle as a variety of phlogosis erythema, on account of its violence, making it synonymous with anthrax, and the erythema gangrenosum of Sauvages.

It is seated in the cellular or adipose substance, like a common boil, but is accompanied with a violent sensation of burning heat, instead of a throbbing or pulsative sensation; and attended with, and surrounded by, a discolouration of the skin, which instead of being red, as in the true inflammation, is of a livid purple hue, and has most commonly one or more black spots upon its surface. It is a peculiar characteristic of this disease, as of the erysipelas, that the patient is always very languid, and the pulse so low, that it is very difficult to raise it by the freest use of the most cordial remedies.

Carbuncles generally break out suddenly and unexpectedly, in an hour or two at the most, and are attended with pain and heat. The inflammation proceeds so quickly to mortification, that there is seldom any evident tumor raised, the parts turning black, and ending in real gangrene, often in the course of twenty-four hours, from the first attack. But when a tumor does arise, as soon as it is opened it discharges a livid sanies, or sometimes limpid water. It is black within, which shows that a sphacelus has seized on the subjacent flesh, and is making rapid progress. In those that recover, a separation is made betwixt the sound and the disordered flesh, by means of a suppuration. There is no part of the human body but what may be their seat; and they are generally attended with buboes. The proximate cause is the inflammation from pestilential contagion, with a putrescent state of the system. The danger is great when their colour is livid: the milder sort are first red and then yellow. When they are seated on the face, neck, back, breast, and arm-pits, they are generally fatal. When they occur, as they sometimes do, internally upon any of the viscera, they must in every instance prove fatal, as we are not acquainted with any remedies which can prevent their progres to mortification. Externally, indeed, when they are not very extensive, nor seated on any of the highly sensible parts, they are frequently got the better of; that is, with loss of the part affected, which sloughs away.

It has been the practice of some surgeons to treat this disease by extirpation; but nothing surely can be more injudicious than to attempt to stop the progress of a disease so nearly allied to gangrene, by an ill-timed operation. Our chief dependence should be on the exhibition of medicines internally. The bark in large quantity, opium, and proper cordials, as Madeira wine, &c. should be given. Externally, to the part, myrrh should be applied, and all round it lint moistened in vinum Chalybeatum. When the tumor is of the red kind, and breaks in several places, we may very properly dilate these orifices, and lay them into one; but our incisions should extend no farther than just to remove the slough, without penetrating the sound parts. In several cases of this disease, we have seen extraordinary good effects follow the use of a poultice, composed of fermenting materials, calculated to generate fixed air in large qnantity: the cataplasma carbonis of the Pharm. Chirurg. may probably answer the purpose best.

Van Swieten describes another sort of carbuncle in his Commentary on Boerhaave's Aphorisms, and says, "it is an ulcer, which, when after a violent and commonly very painful inflammation, there happens a rupture of the skin in several places, and fragments of the corrupted paniculus adiposus are discharged at its orifices."

A'NTI, (*αντι, against*). There are many names compounded with this word by the old writers; as *antiasthmatica*, *antihysterica*, *antidysenterica*, &c. which signify medicines against the asthma, hysterics, dysentery, &c. Sometimes the *i* is cut off in these compound terms; and then we have *antasthmatica*, *anthysterica*, *anthypochondriaca*, &c.

ANTIDOTE, *αντιδοτος*; from *αντι*, *against*, and *διδωμι*, *to give)*; a remedy, or medicine, which possesses the property of counteracting the injurious effects of another, as in the case of poisons. See Poisons.

ANTILY'SSUS, (*αντιλυσσος*; from *αντι*, *against*, and *λυσσα*, *the madness caused by the bite of a mad dog)*; a name for a medicine against the bite of a mad animal.

ANTIMO'NIUM, (*αντιμονιον*), ANTIMONY. The origin of this word is very obscure. The most received etymology is, from *αντι*, *against*, and *μονος*, *a monk)*; because Basil Valentine, by an injudicious administration of it, poisoned his brother monks.

Antimony is a blackish, or dark grey mineral substance, composed of long, shining, needle-like striæ, hard, brittle, and considerably heavy. It is found in different parts of Europe, as Bohemia, Saxony, Transylvania, Hungary, France, and also in England; commonly in mines by itself, intermixed with earth and stony matters. Sometimes it is blended with the richer ores of silver, and renders the extraction of that metal difficult, by volatilizing a part of the silver, or, in the language of the miners, *robbing the ore*.

This mineral is separated from its natural impurities by fusion in an earthen pot, whose bottom is full of holes; the fluid antimony passing through, while the infusible matters remain behind. The melting vessel is set into another pot sunk in the ground. This last, which is of a conical figure, and serves for a receiver, gives the shape to the loaves of antimony usually met with. The juncture of the two vessels is closely luted, the uppermost one covered, and a fire made round it. In some places, instead of a pot with a perforated bottom, one is made use of which has no bottom, and a perforated iron plate is interposed betwixt it and the receiver. But the former method is preferable, as the sulphur contained in the antimony, while in fusion, is apt to dissolve some of the iron. Very little heat is necessary in this operation, for the antimony melts before it is red hot.

For a long time this mineral was esteemed poisonous. In 1566, its use was prohibited in France by an edict of parliament; and, in 1609, one Besnier was expelled the faculty for having given it. The edict was repealed in 1650; antimony having, a few years before, been received into the number of purgatives. In 1668, a new edict came forth, forbidding its use by any but doctors of the faculty. It is now universally allowed, that pure antimony in its crude state has no noxious quality; and that, though many of its preparations are most virulently emetic and cathartic, yet, by a proper regulation of their doses, or the addition of other medicines, they lose their virulence, and become mild in their operation. Antimony was used by the ancients in collyria against inflammations of the eyes, and for staining the eye-brows black. Its most efficacious preparations, are the regulus, glass, and liver. Antimony is also made use of for purifying and heightening the colour of gold.

The *glass of antimony* is produced by the slow and gradual calcination of crude antimony. In this case, the ore affords a grey oxide, which, when urged by a violent heat, is converted into a reddish, and partly transparent glass of antimony. This transparency, however, depends upon the perfection of the fusion. The highly corrosive quality of the glass of antimony is corrected by mixing it with yellow wax, and afterwards burning it off. This is called cerated antimony. See Vitrum Antimonii.

Antimony is difficult of fusion; but, when once melted, it emits a white fume known by the name of flowers of antimony. These fumes, when collected, form very brilliant prismatic tetrahedral crystals; and Mr. Pelletier, a French chymist, has obtained them in transparent octahedrons. The argentine flowers of antimony are soluble in water, which they render emetic; and, in volatility and solubility, this sublimed oxide has a resemblance to the oxide of arsenic, as has been shewn by Mr. Rouelle.

The change that antimony undergoes by exposure to the air, is very slight. The sulphuric acid, by slow ebullition upon this metal, is partly decomposed. Sulphureous gas first escapes, and, towards the end of the operation, sulphur itself is sublimed. If four parts of the acid be used with one of the antimony, the residue, after the action of the acid, consists of the metallic oxide, with a small quantity of the sulphate of antimony, which may be separated by means of distilled water. This sulphate is very deliquescent, and can easily be decomposed in the fire. The nitric acid is also decomposed easily upon this semi-metal. It oxidates a considerable part, and dissolves a portion, which may be suspended in water, and forms a very deliquescent salt, which can be decomposed by heat. The oxide prepared by this means is very white, and very difficult of reduction; and, in fact, is a true bezoar mineral.

It is only by long digestion that the muriatic acid can be made to act upon antimony. Mr. Fourcroy has observed, that this acid, when long digested upon the metal, dissolves it; and that the mixture of antimony, obtained by a strong evaporation in the form of small needles, is very deliquescent, fusible in the fire, and also volatile. It has been shewn by Mr. Monnet, that twelve grains

of the oxide of antimony are sufficient to saturate half an ounce of the common muriatic acid; and it has been constantly found, both by Monnet and Fourcroy, that, in this process, there is a portion of the muriate of antimony which is not volatilized by the fire: this arises from its being strongly oxidated or calcined. If two parts of the corrosive muriate of mercury, and one of antimony, be distilled together, a very slight degree of heat forces over a butyraceous matter, which is called *butter of antimony*, or the sublimed muriate of antimony. It is probable, that the acid in this composition is in the state of oxigenated muriatic acid, as is the case in corrosive sublimate. By a very gentle heat the sublimed muriate of antimony becomes fluid; and, by virtue of this property, it can be conveniently poured from one vessel to another: nothing more is necessary than to plunge the bottle which contains it into hot water, and the muriate may then be poured out in its liquid state. Mr. Chaptal has frequently observed this muriate of antimony crystallized in hexahedral prisms with dihedral summits: two sides of the prism are inclined, and form that which the ancient chemists distinguished by the name of crystals in the form of a rhomb. This muriate is used as an escharotic. If the salt be diluted with water, a white powder falls down, called powder of *algaroth*, or *mercurius vitæ*. This powder does not contain the smallest portion of the muriatic acid; it is merely an oxide of antimony produced by that acid. Simple water has also some action upon this semi-metal; for it evidently becomes purgative by remaining in contact with it. Wine, and the acetous acid, completely dissolve it: the antimonial wine is, however, an uncertain remedy; as it is impossible to determine with absolute certainty the degree of its energy, because that depends upon the variable degree of acidity of the wine made use of. Emetic wine ought not therefore to be used but in external applications. This semi-metal is also dissolved by the gastric fluids, as the operation of the famous *perpetual pills* clearly proved. The acid of tartar with antimony forms a very well known salt, which is much employed in medicine. It is known by the name of *antimonium tartarisatum*, emetic tartar, and stibiated tartar. In the new nomenclature of chemistry, it is distinguished by the title of *antimoniated tartrite of potash*.

In the preparation of this remedy, no uniform process has been recommended, by which it may always have the same strength, and produce the same effects. In making it, some chemists have prescribed the crocus metallorum, or semi-vitreous oxide of sulphurated antimony; others the glass of antimony; some the liver of antimony, or sulphurated oxide of antimony; and others the sublimed oxide: some also advise the combination of several of these substances. In general, however, they employ cream of tartar, or the acidulous tartrite of potash, as a solvent. The processes have not only varied in the choice of the substances employed, but likewise in the proportions in which they are to be used. There appears also to have been a great variation in the quantity of water made use of as a vehicle, which is not an indifferent circumstance; and likewise in the time prescribed to digest the substances together; a matter of the greatest consequence to be ascertained, as the saturation of the acid depends absolutely upon it. Attention is also necessary to the choice of vessels, as they have been found to influence the effect of this remedy. These variations in the process must necessarily have influenced the result; it is therefore not extraordinary that those who analised different antimoniated tartrites of potash should have found different proportions of the metal in a certain quantity of the salt. It is still then of the greatest importance to point out some uniform process for the preparation of this medicine, and by which the product may be invariable.

Professor Chaptal has recommended the following as a very accurate process for making *tartarised antimony*.

Take very transparent glass of antimony, grind it fine, and boil it in water, with an equal weight of cream of tartar, until this salt be saturated. By filtration, and evaporation with a gentle heat, and subsequent repose, crystals of the antimoniated tartrite of potash are obtained, whose degrees of emeticity are sufficiently constant. The crystals may be obtained in several successive products by repeated evaporations.—Macquer has recommended the powder of algaroth, in which he has been followed by different French chemists, and by Bergman with a few trifling alterations. His process is this:

Take five ounces of cream of tartar reduced into powder, and two ounces two drachms of the powder of algaroth precipitated by hot water, washed and dried. Add water to these, and boil them gently.

The crystals of tartarised antimony, may then be obtained, by filtration and evaporation. The antimoniated tartrite of potash crystallises in small trihedral pyramids. It is very transparent, is decomposed on the fire with crackling, and leaves a coaly residue. Sixty parts of water dissolve it. It effloresces in the air, and becomes farinaceous. The solutions of this salt throw down a mucilage, which fixes, and forms a pellicle of considerable thickness: it is the mucilage of cream of tartar, which is insoluble in water, but partly soluble in alkohol. The sulphuric acid blackens it, but does not itself become coloured till after a long time. The nitric acid dissolves it partly; and is itself decomposed, with the ejection of a great deal of nitrous gas.

The antimoniated tartrite of potash is decom-

posed by lime and the alkalis. Antimony, properly mixed with the nitrate, decomposes that salt completely. Equal parts of the semi-metal and nitre being thrown into an ignited crucible, the salt detonates, its acid is decomposed, and, at the end of the operation, the crucible is found to contain the alkali which served as the base of the nitrate, and the antimony reduced to the state of white oxide: this is called *diaphoretic antimony.* The same preparation may be made by using the sulphure of antimony; in which case three parts of the nitrate are used to one of the crude antimony. The residue in the crucible, after the detonation, is composed of the oxide of antimony, fixed alkali, a portion of the nitrate not decomposed, and a small quantity of sulphate of potash. Water deprives it of all the salts it contains; and leaves only the oxide of antimony, commonly called *washed diaphoretic antimony.* If a small quantity of acid be poured on the fluid which holds the salts in solution, a small portion of the oxide of antimony falls down, which was dissolved by the alkali of the nitre. This precipitate forms the *ceruse of antimony.* Equal parts of the sulphure of antimony and of nitrate, detonated in an ignited crucible, form the *liver of antimony,* or sulphurated oxide of antimony; which, when pulverized and washed, produces the saffron of metals, or *crocus metallorum.* The oxides of antimony have generally been considered as very difficult of reduction; but Mr. Chaptal has found them reducible with the greatest facility by the black flux. The alkalis do not sensibly act upon antimony; but the sulphates of antimony dissolve it completely; and it is upon this principle that an operation is founded, by which a remedy is obtained that was once held in high estimation, and known by the name of *kermes mineral.* The preparation is merely a red sulphurated oxide of antimony. Glauber first pointed out this remedy, and made it with antimony and the solution of nitre fixed by charcoal. By some this preparation is also made by boiling pounded sulphure of antimony, with one fourth its weight of fixed nitre or potash in twice its weight of pure water, and afterwards filtering the solution. As this solution cools, the kermes falls down, and is dried for use. The liquor which remains after the kermes is fallen down, contains still more kermes, which may be disengaged by means of an acid. This kermes, which is paler than the former, is known by the name of *golden sulphur of antimony,* or the orange-coloured sulphurated oxide of antimony. At present, however, this process is not followed. The process which Mr. Chaptal has found the most convenient, consists in boiling ten or twelve pounds of pure alkaline solution with two pounds of the sulphure of antimony. The ebullition must be continued for half an hour, after which the fluid is filtered; and much kermes is obtained by mere cooling. He digests new alkali on the antimony, until it be consumed, and by this means obtains kermes of a beautiful tufted appearance.

If lime or lime-water be digested upon pulverised antimony, at the end of a certain time, even in the cold, a kind of kermes, or golden sulphur of antimony, of a beautiful red colour, is produced.

Antimony is the basis of many officinal preparations, to be mentioned under their proper heads. But besides those retained, many others have been formerly in use, and are still employed in medicine by different practitioners. The following table, drawn up by Dr. Black, exhibits a distinct view of the whole.

Table of the Preparations of Antimony.

Medicines are prepared, either from crude antimony, or from the pure metallic part of it, called regulus.

(1.) *From crude Antimony.*

I. By trituration.
Antimonium præparatum. Lond.

II. By the action of heat and air.
Flores antimonii sine addito.
Vitrum antimonii. Edin.
Antimonium vitrificatum. Lond.
Vitrum antimonii ceratum. Edin.

III. By the action of alkalies.
Hepar antimonii mitissimum.
Regulus antimonii medicinalis.
Hepar ad kermes minerale. *Geoffroi.*
Hepar ad tinct. antimonii.
Kermes minerale.
Sulphur antimonii præcipitatum. Edin. et Lond.

IV. By the action of nitre.
Crocus antim. mitissimus, *vulgo, Regulus medicinalis.*
Crocus antimonii. Edin. et Lond.
Antimonii emeticum mitius. Boerh.
Antim. ustum cum nitro, *vulgo,* Calx antimonii nitrata. Edin.
Antimonium calcinatum. Lond. *vulgo, Antimonium diaphoreticum.*
Antimonium calcareo-phosphoratum, sive pulvis antimonialis. Edin.
Pulvis antimonialis. Lond.

V. By the action of acids.
Antim. vitriolat. Klaunig.
Antim. cathartic. Wilson.
Antimonium muriatum, *vulgo,* Butyrum antimonii. Edin.

Antimonium muriatum. Lond.
Pulvis algarothi, sive *Mercurius vitæ.*
Bezoardicum minerale.
Antimonium tartarisatum, *vulgo*, Tartarus emeticus. Edin.
Antimonium tartarisatum. Lond.
Vinum antimonii tartarisati. Edin. et Lond.
Vinum antimonii. Lond.

(2.) *From the Regulus of Antimony.*

This metal, separated from its sulphur by different processes, is called *Regulus antimonii simplex*, *Regulus martialis*, *Regulus jovialis*, &c. From it have been prepared,

I. By the action of heat and air,
Flores argentei, sive nix antimonii.

II. By the action of nitre,
Cerussa antimonii.
Stomachicum Poterii
Antihecticum Poterii.
Cardiacum Poterii.

PREPARATIONS which have their name from ANTIMONY, but scarcely contain any of it.

Cinnabaris antimonii.
Tinctura antimonii.

To this table of Dr. Black's, which is left unaltered, Dr. A. Duncan has added the following, which is not taken from the mode of preparation, but from the nature of the product. He describes it thus in the "Edinburgh New Dispensatory," in which the synonymes are observed:

"ANTIMONY has been exhibited,

I. "In its *metallic state:*
a. Antimonium. Regulus antimonii.
b. Alloyed,
1. With iron. Regulus antimonii martialis.
2. With tin. Regulus antimonii jovialis.
3. With tin and copper. Regulus metallorum.
c. Combined with sulphur.
1. Sulphuretum antim. (Edin.) Antimonium. (Lond.) Stibium. (Dubl.) Sulph. antim. ppt. Edin. Lond. Dubl.
2. Regulus antimonii medicinalis. (Maët.) Febrifugum Cranii.

II. "In its *oxidized state:*
a. Protoxide.
1. Calx antimonii *per se.* Cinis antimonii.
2. Flores antimonii argentini.
3. Calx stibii præcip. *Dubl.* Pulvis algarothi.
4. Combined with sulphuret of antimony. Oxidum antimonii cum sulphure vitrificatum. *Edin.*
Antim. vitrif. *Lond.* Vitrum antimonii. *Melted with wax.* Oxidum antimonii vitrif. cum cera. *Edin.*
Oxidum antimonii cum sulph. per nitrat. potassæ, *Edin.* Stibium nitro calcinat. *Dubl.* Crocus antimonii. Crocus metallorum. Hepar antimonii.
5. Combined with sulphuretted hydrogen. Sulphuret. ant. præcip. *Edin.* Sulph. ant. præcip. *Lond.* Sulph. stibias rufam. *Dubl.* Sulphur auratum antimonii.
6. With hydroguretted sulphur. Sulphur stibiat. fuscum. *Dubl.* Kermes minerale.
7. With muriatic acid. Murias antim. *Edin.* Ant. muriat. *Lond.* Stib. muriat. caust. *Dubl.* Butyrum antimonii.
8. With tartaric acid and pot-ass. Tartris antimonii, *Edin.* Antim. tararisat. *Lond.* Tart. stibiat. *Dubl.* Tartarus emeticus. *Dissolved in wine.* Vinum tart. ant. *Edin.* Vin. tart. stibiat. *Dubl.* Vin. ant. tart. *Lond.* Vin. antim. *Lond.* Vinum antimoniale.
9. With phosphate of lime. Oxidum antimonii cum phosphate calcis. *Edin.* Pulv. antimonial. *Lond.* Pulv. stibiat. *Dubl.* *James's powder.*
b. Peroxide.
Antimonium calcinatum. *Lond.*

The author observes, that, in estimating the comparative virtues of the principal preparations of antimony, we should attend to the following circumstances: In its metallic forms, antimony, and also its preparations, are uncertain, as it entirely depends on the state of the stomach if they have any action at all, or whether they operate with great violence.

"The sulphuret," says he, "is exposed, though in a less degree, to the same objections. The preparations in which antimony is in the state of peroxide, are perfectly insoluble in any vegetable or animal acid, and are also found to be perfectly inert when taken into the stomach.

"The remaining preparations of antimony, or those in which it is in the state of protoxide, are readily soluble in the juices of the stomach, and act in very minute doses. Of its saline preparations, only those can be used internally which contain a vegetable acid; for its soluble combinations with the simple acids are very acrid and corrosive. In general, the surest and best preparations of antimony are those which contain a known quantity of the metal in its state of protoxide.

"The general effects of antimonial preparations, are, in small doses, diaphoretic, and exciting nausea; in large doses, full vomiting and purging. Some allege, that antimonials are of the greatest use in fevers *when they do not produce any sensible*

vacuation, as is said to be the case sometimes with *James's powder*. They therefore prefer the latter in typhus, and tartarised antimony in synochus, in which there is the appearance at first of more activity in the system, and far more apparent cause for evacuation."

For the preparations of this mineral, see their several names.

ANTIMO'NIUM CALCINATUM; *calx antimonii;* or *antimonium diaphoreticum*. This preparation of antimony is termed *oxydum stibii album*, in the new chemical nomenclature.

Antimonium Calcinatum. Lond.

Take of Antimony, powdered, eight ounces; nitre powdered, two pounds.

Mix them, and cast the mixture by degrees into a red hot crucible.

Burn the white matter about half an hour; and, when cold, powder it; after which wash it with distilled water.

In a former edition of the London Pharmacopœia this preparation had the name of *calx of antimony;* and it may be considered as at least very nearly approaching to some other antimonials of the old pharmacopœias, particularly to the nitrated diaphoretic antimony, washed ditto, and stibiated nitre; none of which are now received as separate formulæ of the Edinburgh pharmacopœia.

The calx of antimony, when freed by washing from the saline matter, is extremely mild, if not altogether inactive. Hoffman, Lemery, and others, assure us, that they have never experienced from it any such effects as its usual title imports; Boerhaave declares, that it is a mere metallic earth, entirely destitute of all medicinal virtue: and the Committee of the London College admit that it has no sensible operation. The common dose is from five grains to a scruple or half a drachm; though Wilson relates, that he has known it given by half ounces, and repeated two or three times a day, for several days together.

Some report that this calx, by keeping for a length of time, contracts an emetic quality; from whence it has been concluded, that the powers of the reguline part are not entirely destroyed, that the preparation has the virtues of other antimonials which are given as *alteratives;* that is, in such small doses as not to stimulate the primæ viæ; and that, therefore, diaphoretic antimony, or calcined antimony, as it is now more properly styled, is certainly among the mildest preparations of that mineral, and may be used for children, and similar delicate constitutions, where the stomach and intestines are easily affected. The observations, however, from which these conclusions are drawn, do not appear to be well founded: Ludovici relates, that after keeping the powder for four years, it proved as mild as at first; and the Strasburgh pharmacopœia, with good reason, suspects, that where the calx has proved emetic, it had either been given in such cases as would of themselves have been attended with this symptom (for the great alexipharmic virtues attributed to it have occasioned it to be exhibited even in the more dangerous malignant fevers, and other disorders which are frequently accompanied with vomiting); or that it had not been sufficiently calcined, or perfectly freed from such part of the regulus as might remain uncalcined. The uncalcined part being grosser than the true calx, the séparation is effected by often washing with water, in the same manner as directed for separating earthy powders from their grosser parts.

It has been observed, that when diaphoretic antimony is prepared with nitre abounding with sea-salt, of which all the common nitre contains some portion, the medicine has proved violently emetic. This effect is not owing to any particular quality of the sea-salt, but to its quantity, by which the proportion of the nitre to the antimony is rendered less.

The *nitrum stibiatum*, as it was called, is produced by the deflagration of the sulphur of the antimony with the nitre, in the same manner as the *sal polychrest*, from which it differs no otherwise than in retaining some portion of the antimonial calx.

Notwithstanding the doubts entertained by some respecting the activity of the antimonium calcinatum, yet the London College have in our opinion done right in retaining it. For, while it is on all hands allowed that it is the mildest of our antimonials, there are some accurate observers who consider it as by no means inefficacious. Thus, as Dr. Healde tells us, that he has been in the habit of employing it for upwards of forty years, and is much deceived, if, when genuine, it be not productive of good effects.

ANTIMO'NIUM MURIATUM; *murias antimonii; butyrum antimonii;* or *causticum antimoniale*. This preparation of antimony, called in the new chemical nomenclature *murias stibii hyperoxygenatus*, is employed in destroying warts, carcinomatous excrescences, &c.

Antimonium Muriatum. Lond. Edin.

Take of Crocus of antimony, powdered,
Vitriolic acid, of each one pound;
Dried sea salt, two pounds.

Pour the vitriolic acid into a retort, adding by degrees the sea-salt and crocus of antimony, previously mixed; then distil in a sand bath. Let the distilled matter be exposed to the air for several days, and pour the liquid from the dregs.

In a former edition of the Edinburgh Dispensatory the *butyrum antimonii*, as this preparation was called (though since named *murias antimonii)*, was made by adding one part of crude antimony to two parts of muriated quicksilver, which, after being thoroughly mixed, was distilled from a retort; in which process an oily liquor ascended and congealed in the neck of the retort, appearing like ice; this was melted down by a live coal cautiously applied, and this oily matter was rectified in a glass retort into a pellucid liquor. However, now the College has adopted the same method as that of London, which is considered not only as a less dangerous process, but also preferable to any other.

The muriated antimony appears to be a solution of the metallic part of the crocus in the marine acid. If regulus of antimony were added in the distillation of spirit of sea-salt without water, a like solution would be made.

When the congealed matter that rises into the neck of the retort is liquefied by the moisture of the air, it proves less corrosive than when melted down and rectified by heat; though it seems, in either case, to be sufficiently strong for the purposes for which it is intended, as the *consuming of fungous flesh*, and the *callous lips of ulcers*. It is remarkable, that though this saline concrete readily and almost entirely dissolves by the humidity of the air, only a small quantity of white powder separating, it nevertheless will not dissolve on putting water to it directly. Even when previously liquefied by the air, the addition of water will precipitate the solution.

And accordingly, by the addition of water is formed, that once celebrated powder named *mercurius vitæ*, or *Algaroth powder*, which has not now any place in either of the Pharmacopœias. See Antimonium.

ANTIMO'NIUM TARTARISATUM; *tartris antimonii; tartarus emeticus; tartarus antimonialis.* This is the most valuable perhaps of our antimonial remedies, but its mode of preparation has been attended with some difficulties.

Antimonium Tartarisatum. Lond.

Take of Crocus of antimony, powdered, one pound and a half;
Crystals of tartar, two pounds;
Distilled water, two gallons.

Boil them in a glass vessel about a quarter of an hour: filter the liquor through paper, and set it by to crystallize.

Tartris Antimonii. Edin.

Take of Oxide of antimony with sulphur, by nitrate of potass, three parts,
Super-tartrite of potass, four parts;
Distilled water, thirty-two parts.

Boil these together in a glass vessel for a quarter of an hour, strain the liquor through paper, and set it aside to crystallize.

Tartarum Stibiatum. Dubl.

Take of Precipitated calx of antimony, two ounces;
Crystals of tartar, in fine powder, four ounces;
Distilled water, five pounds.

Boil them till the powders be dissolved, and filter the liquor, when cold; then, having thrown away the salt which appears upon the paper, crystallize the rest by evaporation and slow refrigeration.

If properly managed the crystals will have a regular figure.

The acid of tartar is known to be capable of combining with two bases at the same time, and of forming with them triple salts. Here it is combined with the oxide of antimony and potass; which last being essential to its constitution, Dr. A. Duncan says, entitles it rather to the name of *tartrate of antimony and potass.*

In preparing tartarised antimony, different combinations of antimony have been employed. A very pure salt may be obtained from the crocus, precipitated oxide, submuriate, or glass. The London and Edinburgh Colleges use the former, to which the principal objection is, that it is never found in the shops in a state fit for the purpose. The Dublin College use the precipitated oxide, which answers extremely well, but is too expensive. Dr. A. Duncan says, the submuriate, which is more easily prepared, is just as good; for the muriate acid is completely separated by part of the potass, and remains in the mother-water. In this way he has repeatedly prepared tartarised antimony perfectly colourless, and in very large and beautiful crystals.

By employing the washed crocus, as in the first process, it proves of a whiter colour, and likewise more certain in strength; though it will still be somewhat precarious in this last respect, if the crystallisation be complied with; for some of the tartar, even though the operation be performed with a good deal of care, will be apt to shoot by itself, retaining little or nothing of the antimony. It should seem, therefore, more eligible, as soon as the solution has passed the filter, to proceed to the total evaporation of the liquor, or at least to evaporate lower than is usual for crystallisation, that the whole may shoot at once; but in order to secure the uniform strength, after the crystals are all separated from the liquor, they ought to be beat together in a glass mortar, into a fine powder, which will answer the desired purpose.

The tartarised antimony is one of the best of the

antimonial emetics, acting more powerfully than the quantity of crocus contained in it would do by itself, though it does not so much ruffle the constitution. And indeed antimonials in general, when thus rendered soluble by vegetable acids, are more safe and certain in their effects, than the violent preparations of that mineral exhibited by themselves; the former never varying in their action from a difference in the food taken during their use, or similar circumstances, which occasioning more or less of the others to be dissolved, make them operate with different degrees of force. Thus crude antimony, where acid food has been liberally taken, has sometimes proved violently emetic; whilst, in other circumstances, it has no such effect.

The dose of tartarised antimony, when designed to produce the full effect of an emetic, is from three to four or six grains. It may likewise be advantageously given in smaller doses, half a grain for instance, as a *diaphoretic* and *alterative* in cutaneous disorders; and added, in the quantity of a grain, as a stimulus to ipecacuanha, &c. Added to purgative medicines, in small doses, it certainly assists their operation, and makes them act more quickly.

Before we quit this subject, it may be necessary to make one observation—that the activity of the reguline part of antimony depends upon its union with acids; the union being formed either in the stomach, with the acid to be met with in that organ, or from, and before it is administered internally: hence it is why the calces are so uncertain in their operation, sometimes operating violently, at others, not at all; and hence may it be accounted for why they produce such different effects, at different times; very small doses being much more active at one time, than doses much increased are at another. Hence it is obvious why the preparations, consisting of the reguline part of antimony already in combination with an acid, are the most certain and constant in their operations; and such is the tartarised antimony, whose doses and effects may be measured with great exactness. Some improvements, in the preparation of this remedy, proposed by Chaptal, Bergman, and others, are spoken of under the article ANTIMONIUM.

ANTIMO'NIUM VITRIFICATUM; glass of antimony; the *oxidum antimonii vitrificatum* of the Edinburgh College.

Antimonium Vitrificatum. Lond.

Take of Antimony, powdered, four ounces.

Burn it in a broad earthern vessel, raising the fire gradually, and stirring with an iron rod, until it no longer emits any smoke. With this powder fill two-thirds of a crucible, and fit on a cover; let the heat at first be moderate, and afterwards stronger, until it melts into glass, which may be poured from the crucible.

Oxidum Antimonii, cum Sulphure, Vitrificatum. Edin.

Strew antimony reduced to a coarse powder, like sand, upon a shallow earthern unglazed vessel, and place it upon a moderate fire, that the antimony may be slowly heated, stirring the powder constantly at the same time, that the antimony may not run into lumps. White vapours, smelling like sulphur, will arise; when these, with the same degree of fire become deficient, increase the fire a little, that vapours may again exhale, and thus persist till the powder brought to a red heat exhales no more vapours. This powder should be put into a crucible, and melted with a very strong fire, until it puts on the appearance of liquified glass; then let it be poured out upon a brass plate, or dish, made hot.

The calcination of antimony, to fit it for making a transparent glass, succeeds very slowly, unless the operator be very wary and circumspect in the management of it. The most convenient vessel is a broad shallow dish, or a smooth flat tile, placed under a chimney. The antimony should be the purer sort, such as is usually found at the apex of the cones. This, grossly powdered, is to be evenly spread over the bottom of the pan, so as not to lie above a quarter of an inch thick on any part. The fire should be at first no greater than is just sufficient to raise a fume from the antimony, which is to be now and then stirred; when the fumes begin to decrease, increase the heat, taking care not to raise it so high as to melt the antimony, or run the powder into lumps; after some time the vessel may be made red hot, and kept in this state, until the matter will not, upon being stirred, any longer fume. If this part of the process be duly conducted, the antimony will appear in an uniform powder, without any lumps, and of a grey colour.

With this powder fill two-thirds of a crucible, which is to be covered with a tile, and placed in a wind-furnace. Gradually increase the fire, till the calx be in perfect fusion, when it is to be now and then examined by dipping a clean iron wire into it. If the matter, which adheres to the end of the wire, appear smooth and equally transparent, the vitrification is completed, and the glass may be poured out upon a hot smooth stone, or copper-plate, and suffered to cool by slow degrees, to prevent its cracking and flying in pieces. It is of a transparent yellowish red colour.

The glass of antimony usually met with in the shops, is said to be prepared with certain additions,

which may perhaps render it not so fit for the purposes here designed. By the method above directed, it may be easily made, in the requisite perfection, without any addition.

As antimony may be rendered nearly or altogether inactive by calcination, it might be expected that the calx and glass of the present process would be likewise inert. But here the calcination is far less perfect than in the other case, where the inflammable principle of the regulus is totally burnt out by deflagration with nitre; there the calx is of perfect whiteness, and a glass made from that calx (with the addition of any saline flux, for of itself it will not vitrify) has little colour: but here so much of the inflammable principle is left, that the calx is grey, and the glass of a high colour. The calcined antimony is said by some writers to be violently emetic. Experience has shown that the glass is so, insomuch as to be unsafe for internal use. It is employed chiefly, in the present practice, as being subservient to some other preparations, particularly tartarised antimony and antimonial wine; and in combination with wax, and some other subtances, by which its power is obtunded.

The Edinburgh College direct the glass of antimony to be prepared with wax, as a remedy in dysentery. For this, which is the old *vitrum antimonii ceratum*, see Oxidum Antimonii Vitrificatum, *cum cera*.

ANTIPATHY, in physiology, is, properly speaking, formed from the two Greek words, *αντι*, *contrary*, and *παθος*, *passion*. Literally taken, the word signifies *incompatibility*: but for the most part the term *antipathy* is not used to signify such incompatibilities as are merely physical; it is reserved to express the aversion which an animated or sensitive being feels at the real or ideal presence of particular objects. In this point of view, which is the light in which we at present consider the term, *antipathy*, in common language, signifies "a natural horror and destestation, an insuperable hatred, an involuntary aversion, which a sensitive being feels for some other object, whatever it is, though the person who feels this abhorrence is entirely ignorant of its cause, and can by no means account for it." Such is, they say, the natural and reciprocal hostility between the salamander and the tortoise; between the toad and the weasel; or between sheep and wolves. Such is the invincible aversion of particular persons against cats, mice, spiders, &c.; a prepossession which is sometimes so violent, as to make them faint at the sight of these animals. Of these and a thousand other antipathies the ancient naturalists, the schoolmen, and the vulgar, form so many legends; and relate them as certain facts, that they may demand an explication of them from the philosophers. But these sages begin with investigating whether such antipathies actually exist or not.

To explore the matter without prejudice, we shall find it necessary to abstract from the subjects of this disquisition, 1. All such antipathies as are not ascertained; as that which is supposed to be felt by hens at the sound of an harp whose strings are made of a fox's bowels; between the salamander and tortoise; and between the weasel and the toad. Nothing is less confirmed, or rather nothing is more false, than these tales, with which vulgar credulity and astonishment are amused and actuated; and though some of these antipathies should be ascertained, this would be no proof that the animals which feel them are not acquainted with their causes, according to their mode and proportion of knowledge; in which case, it will be no longer the antipathy which we have defined.

2. We must abstract those antipathies which can be extinguished or resumed at pleasure; those fictitious aversions, which certain persons feel, or pretend to feel, with affected airs, that they may appear more precise and finical, or singularly and prodigiously elegant; that they may seem to have qualities so exquisitely fine, as require to be treated with peculiar delicacy. One who bestows any attention on the subject, would be astonished to find how many of these chimerical aversions there are, which are pretended, and passed upon the world, by those who affect them as natural and unconquerable.

3. When we abstract those aversions the causes of which are known and evident, we shall be surprised, after our deduction of these pretended antipathies from the general sum, how small, how inconsiderable, is the quantity of those which are conformable to our definition. Will any one pretend to call by the name of *antipathy*, those real, innate, and incontestable aversions which prevail between sheep and wolves? Their cause is obvious: the wolf devours the sheep, and subsists upon his victims; and every animal naturally flies with terror from pain or destruction: sheep ought, therefore, to regard wolves with horror, which, for their nutrition, tear and mangle the unresisting prey. From principles similar to this, arises that aversion which numbers of people feel against serpents; against small animals, such as reptiles in general, and the greatest number of insects. During the credulous and susceptible period of infancy, pains have been taken to impress on our minds the frightful idea that they are venomous; that their bite is mortal; that their sting is dangerous, productive of tormenting inflammations or tumors, and sometimes fatal: they have been represented to us as ugly and noxious; as being, for that reason, pernicious to those who touch them; as poisoning those who have the misfortune to swallow them. These horrible prepossessions are industriously inculcated from our infancy; they are sometimes attended and supported by

dismal tales, which are greedily imbibed, and indelibly engraven on our memories. It has been taught us both by precept and example, when others at their approach have assumed in our view the appearance of detestation and even of terror, that we should fly from them, that we should not touch them. Is it not wonderful (if our false impressions as to this subject have been corrected neither by future reflections nor experiments), that we should entertain, during our whole lives, an aversion from these objects, even when we have forgot the admonitions, the conversations, and examples, which have taught us to believe and apprehend them as noxious beings? and in proportion to the sensibility of our frame, in proportion as our nerves are irritable, our emotions at the sight of what we fear will be more violent, especially if they anticipate our expectation, and seize us unprepared, though our ideas of what we have to fear from them are the most confused and indistinct imaginable. To explain these facts, is it necessary to fly to the exploded subterfuge of occult qualities inherent in bodies, to latent relations productive of antipathies, of which no person could ever form an idea?

It is often sufficient to influence a person who had formerly no aversion for an object, if he lives with some other associate who gives himself up to such capricious panics; the habit is insensibly contracted to be agitated with disagreeable emotions at the presence of an object which had been formerly beheld with indifference and cold blood. I was acquainted (says the author of the article *Antipathy* in the French Encyclopedie), with a person of a very sound understanding, whom thunder and lightning by no means terrified; nay, to whom the spectacle appeared magnificent and the sound majestic; yet to a mind thus seemingly fortified against the infectious terror, no more was necessary than spending the summer with a friend in whom the appearance of lightning excited the strongest emotions, and whom the remotest clap of thunder affected with extravagant paroxysms, to become timid in excess at the approach of thunder, nor could he ever afterwards surmount the fear which it inspired. The frightful stories of dogs and cats, which have killed their masters, or which have given them mortal wounds, are more than sufficient to inspire a timorous person with aversion against these animals; and if the olfactory nerves of such a person be delicate, he will immediately discover the smell of them in a chamber: disturbed by the apprehension which these effluvia excite in his mind, he gives himself up to the most violent uneasiness, which is tranquillized when he is assured that the animal is no longer in the room. If by chance, in the search which is made to calm the uneasiness of this timorous person, one of these creatures should at last be discovered, every one presently exclaims, *a miracle!* and admits the reality of antipathies into his creed; whilst all this is nothing but the effect of a childish fear, founded on certain confused and exaggerated ideas of the hazard which one may run with these animals. The *antipathy* which some people entertain against eels, though they are eaten by others with pleasure, arises from nothing but the fear of serpents, to which these fishes are in some degree similar. There are likewise other antipathies which do not originate in the imagination, but arise from some natural incongruity; such as we often remark in children, for particular kinds of victuals, with which their taste is not offended, but which their stomachs cannot digest, and which are, therefore, disgorged as soon as swallowed.

To what then are those antipathies, of which we have heard so much, reducible? Either to legendary tales; or to aversions against objects which we believe dangerous; or to a childish terror of imaginary perils; or to a disrelish, of which the cause is disguised; or to a ridiculous affectation of delicacy; or to an infirmity of the stomach; in a word, to a real or pretended reluctance for things which are either invested, or supposed to be invested, with qualities hurtful to us. Too much care cannot be taken in preventing, or regulating, the antipathies of children; in familiarizing them with objects of every kind; in discovering to them, without emotion, such as are dangerous; in teaching them the means of defence and security, or the methods of escaping their noxious influence; and, when the rational powers are matured by age, in reflecting on the nature of those objects which we fear, in ascertaining what has been told concerning their qualities, or in vigorously operating upon our own dispositions to overcome those vain repugnances which we may feel. See SYMPATHY, which is the opposite of *Antipathy*.

ANTIPHLOGISTIC (from αντι, *against*, and φλογοσις *inflammation*), medicines or remedies suited to resist, diminish, or cure inflammation, or an inflammatory diathesis of the constitution. Under this head may be classed all watery diluents, cooling saline aperients, diaphoretics, and diuretics; antimony in small doses, but particularly bleeding, *general* and *topical*. Living on mild and cooling vegetables, drinking copiously of simple watery liquids, and abstaining totally from all animal food and stimulating diet, may be classed amongst the most material efforts for promoting a reduced state of the system, which is the object aimed at where antiphlogistics are employed.

ANTIRRHINUM, (αντιρρινον; from αντι, *against*, and ρις, the *nose;* so called because it represents the nose of a calf); SNAP-DRAGON, or CALVES-SNOUT; a genus of the angiospermia order, belonging to the didynamia class of plants. To this genus Linnæus has joined the linaria and assarina;

but as these are generally kept separate by other botanical writers, and several species of each of them described, we chuse to follow their example.

The *species* are: 1. The *majus*, with spear-shaped leaves, having footstalks. This is not a native of Britain; but having been brought into gardens, and the seeds scattered about in great plenty, it is become common upon walls and old buildings in many parts of the country. Of this sort there are several varieties, which differ in the colour of their flowers; some having red flowers with white mouths, while others have white flowers with yellow mouths. There is also one with stripped leaves. 2. The *latifolium*, with smooth spear-shaped leaves, is a nativive of the Archipelago islands. The leaves are much broader, the flowers greatly larger and more beautiful, than those of any other species, and therefore this generally finds a place in gardens. The other species are the *minus*, with obtuse spear-shaped leaves; the *italicum*, with narrow, hairy leaves; the *siculum*, with footstalks proceeding from the wings of the leaves; and the LINARIA, which see.

These plants begin to flower in July and continue flowering till prevented by frost. When planted on walls, they will have strong woody stems. Their use has been recommended in dropsies.

ANTIRRHINUM LINARIA; the systematic name for the *linaria* of the pharmacopœias. See LINARIA.

ANTISCORBUTICS, (*antiscorbutica medicamenta*; from *anti*, against, and *scorbutus*, the scurvy); those medicines which cure the scurvy, or retard its progress. Dr. Cullen ascribes antiscorbutic virtues to the acrid condiments, as mustard, horse-radish, &c. and also to the milder, as the leek, onion, &c. To this class also belong oxygen gas, the acids, common vegetables, bark, &c. See CONDIMENTS.

ANTISEPTICS, (*antiseptica*, αντισηπτικα; from αντι, *against*, and σηπω, to *putrefy*); those medicines which possess the power of preventing animal substances from passing into a state of putrefaction, and of obviating putrefaction in the system when already begun. This class of medicines, comprehends four orders. 1. *Tonic antiseptics*, which are suited for every condition of body, and are, in general, preferable to other antiseptics, for those of relaxed habits. 2. *Refrigerating antiseptics*, as *acids*, *&c.* which are principally adapted for vigorous, and plethoric habits. 3. *Stimulating antiseptics*, as *wine* and *spirits*, best adapted for the old and debilitated. 4. *Antispasmodic antiseptics*, such as *camphor* and *asafœtida*, which are calculated for irritable and hysterical habits.

Physicians universally admit, that there is, in the animal œconomy, a constant tendency to putrescency. Complete putrefaction however, Dr. Cullen observes, cannot, in any considerable portion of the body, take place without proving fatal; and therefore a competent putrefaction is not a disease of a living body that can be an object of medical practice. It is the *tendency to it*, he says, which, when in considerable degree, produces various morbid effects, and requires the exercise of our art. By what steps this tendency proceeds, and in what different degrees it may appear, we do not clearly understand; and therefore, this tendency, in all its several degrees, is denoted by the general name of Putrescency; and the medicines to moderate and correct this, are commonly named antiseptics.

But we must observe, that the state of putrescency in the living body seems to be in different conditions, and therefore to require different treatment. The one Dr. Cullen calls *acute*, the other *chronic*, putrescency. The first attends febrile disorders of various kinds; or, occasionally, fevers of every kind. What is the chemical state of the fluids in this putrescency, cannot be determined with any clearness. But, in his First Lines of the Practice of Physic, speaking on the subject of prognostics in fever, he has marked the various symptoms by which the putrescent state of the fluids may be discovered.

The chronic species of putrescency, is, what appears in the scurvy; and although the nature of the fluids in this disease is not well ascertained, yet it is enough that the symptoms of the disease are so well known, and so characteristically determined, as to justify the treatment of it by antiseptic remedies, which are often successfully employed in the cure of it. Of these, in particular, the Doctor next proceeds to speak; but makes a remark that in some measure affects the general system he has adopted.

"I have said," he observes, "that one state of putrescency is that which especially accompanies febrile disorders; but I believe that the same state may occur without having any fever joined with it. Several instances have occured in which numerous petechiæ have appeared on the surface of the body, without any fever happening at the same time: but as, with these petechiæ, there occurs a fetid breath and bleeding gums, these symptoms added to the petechiæ, have been considered as marks of a putrescent state of the fluids.

"The following instance seems applicable to our present consideration: A woman who lived very constantly upon vegetable aliment, and had not been exposed, so far as could be judged, to any febrile or putrid contagion, was, without feeling any other disorder, affected with numerous petechiæ over the whole surface of her body. After these had continued for some days, without any symptom of fever, she was affected with swelled and bleeding gums, with fetid breath and much

thirst; and in the course of a week or two more, almost every symptom of a putrid fever came on, and in a few days proved fatal.

"Such instances, with the petechial cases abovementioned, seem to show, that the human fluids, without fever, and without the causes of scurvy having been applied, may run into a putrescent state; and whether this case may be considered as a peculiar state of putrescency, I dare not determine, but am much disposed to think it not much different from the others; and that, indeed, though different by its causes, it is much the same with the febrile putrescency."

The *particular antiseptics* enumerated by our author are the following:

1. *Acid salts:*—All of these are deemed antiseptic, and fit to be employed in cases of putrescency. The fossil acid, however, cannot be employed in scurvy with any advantage; as that disease requires a change in the animal fluid, which these acids are incapable of producing. See Acids. It is therefore that in this disease the vegetable acids, as being capable of union with the animal fluid, are more universally proper, and are accordingly employed with certain success. In febrile putrescency, the sulphuric acid, has been very freely employed; but as this does not unite with the animal fluid, and is even limited in the quantity in which it can be exhibited, Dr. Cullen contends, that the vegetable acid, is more likely to be effectual in such cases. It is uncertain, he says, whether, as antiseptics, there is any difference between the native vegetable acids, and the fermented acid, or vinegar. In cases of febrile putrescency, the latter may be generally useful, and perhaps more fit than the former; but in cases of scorbutic putrescency, there is little doubt that the native acid will be the most useful.

2. *Alkaline salts.*—These, from experiments out of the body, appear to be endowed with truly antiseptic powers; but at the same time, it is equally well known, that both the fixed and volatile alkalies are imbued with such an acrimony that they cannot be introduced into the body without acting more by their stimulant than by their antiseptic powers. The latter may sometimes indeed be useful in putrid fevers; but it cannot, as some have imagined, be given more freely on account of its antiseptic powers, as it can never be given in sufficient doses to operate by these particular qualities.

3. *Neutral salts.*—These, as far as we can learn, by experiments out of the body, are manifestly antiseptic; but how far applicable in cases of morbid putrescency, is to be doubted. As, in Dr. Cullen's opinion, scurvy consists in a preternaturally saline state of the blood, so he apprehends that every addition of saline matter must be in some measure hurtful, and therefore he concludes that they are not suitable in that disease.

As a remedy in febrile putrescency, however, no such objection seems to lie against their use: and hence they are commonly employed in fevers, both for their refrigerant and antiseptic properties. The former purpose is often obtained by their operation on the stomach; but it is not so evident that their refrigerant power renders them antiseptic; and Dr. Cullen doubts whether, in any quantity in which they can be taken into the body, their antiseptic power can ever be considerable. Thus one ounce of nitre, exhibited in divided doses, in twenty-four hours, he thinks, can have little effect on a fermentation going on in the whole mass of fluids, consisting of at least fifteen pounds.

4. *Olera acescentia.*—By experience these are found to be the most effectual antiseptics that can be employed in the scurvy, and they admit of being copiously exhibited. It is known that the most certain means of obviating scurvy is by filling the blood-vessels with acescent fluids. Hence Dr. Cullen's idea that sugar and honey, freely employed in diet, might be a means of preventing the scurvy; and hence probably the successful employment of malt infusions. It is not indeed certain, that sugar, in its purely saline state, will so readily enter the animal fluid as farinaceous matter, which, at the same time, contains a quantity of other alimentary matter; yet there is no doubt, but that the virtues of the infusion of malt, chiefly depend upon the sugar which it contains.

To this list of antiseptic substances Dr. Cullen adds the "*plantæ siliquosæ et alliaceæ*," as both these orders possess that power out of the body, and may be supposed therefore to have more or less of the same when taken into the blood. Even upon that footing, these have their use in scurvy, though their properties are not considerable, except in such a quantity as can be employed as alimentary, and at the same time be directed to an acescent fermentation. They cannot, however, be considered as powerful antiseptics.

Of *astringent substances* and *bitters*, Dr. Cullen makes very slight mention; and asserts that they have never been found very useful in obviating scurvy. Yet in cases of febrile putrescency, attended with great debility, they may possibly, by their tonic powers, merit attention. He says too that the benefit which has been received from bark in the scurvy has never been remarkable; hence, except in febrile putrescency, in which its powers are well known and acknowledged, it should never occupy the place of more effectual antiseptics.

Aromatics and their essential oils, have been certainly, in experiments out of the body, found to be antiseptic; but they cannot, on account of their stimulant and heating qualities, be exhibited in any cases of putrescency, except in certain instances of gangrene, and then only externally.

Camphor possesses no power more remarkable than its antiseptic; yet, in this way, it can hardly be given in sufficiently large quantity. Dr. Cullen advises, that in all cases of putrid fever, where it can be admitted, it ought always, with a view to its antiseptic power, to be employed as largely as possible. External putrescency is greatly resisted also by its use.

Some other articles in the catalogue of antiseptics, *Saffron*, *Contrayerva*, *Valerian*, and *Opium*, and the gummi resinæ, are mentioned as having been found, in experiments out of the body, to be in some measure antiseptic: but none of them are so considerable, in this view, as to promise much in cases of morbid putrescency.

Fermented liquors have been elsewhere spoken of; and as for alkohol, though certainly one of the most powerful antiseptics known, we cannot so divest it of its stimulant power, as to render it fit for being employed in cases of morbid putrescency. Dr. Cullen however suggests, that, as some cases of putrescency are attended with great debility, whether in these, alkohol, properly diluted, might not be employed instead of wine and bark, where the latter are not to be got. See the several articles here spoken of, under their proper heads.

ANTISPASMODICS, *(antispasmodica*, αντισπασμοδικα; from αντι, *against*, and σπασμος, *spasm)*; those medicines which possess the power of allaying inordinate motions in the system, particularly those involuntary contractions which take place in muscles, naturally subject to the will. The substances referable to this class are of two kinds. 1. *Stimulating antispasmodics*, as volatile alkali, essential oils, æther, &c. which are proper to be given to those with torpid habits. 2. *Sedative antispasmodics*, as camphor, musk, and opium, which are preferable to the former for sanguine and irritable constitutions.

Dr. Cullen describes those antispasmodics which he holds to be properly and strictly such, to be of two kinds: *First*, Those substances, of a disagreeable odour, which are commonly named *fœtids*, and which are produced both from vegetable and animal substances. The operation of these he explains by saying, that as all disagreeable sensations are sedative, or have the effect of weakening the energy of the brain, so fœtid medicines, by obviating or moderating the increased incitement which begins spasmodic affections, may act as antispasmodics. *Secondly*, Another kind of antispasmodics may consist of the highly volatile oils, and these, by their volatility, acquire a singular property with regard to the nervous fluid. "These, says Dr. Cullen, "have manifestly the power of moderating that excitement which begins spasmodic affections, and are thereby the remedies of such. But I conceive them to have also another power, which, though I cannot explain, seems to be manifestly that of giving a tone and steadiness to the energy of the brain, so as to prevent those sudden alternations of excitement and collapse in which so many convulsive disorders consist." This, however, the doctor offers only as a conjecture to be farther examined by speculative physicians. For, whilst the nature of the nervous power and its several motions are still so imperfectly known, he seems to think this very allowable, if regard be had to a proper reserve in the application.

The *particular antispasmodics* are drawn, for the most part, either from the vegetable or animal kingdoms. Dr. Cullen, however, begins his catalogue with three substances, *amber*, *ambergrise*, and *petroleum*, which do not fall under either of those heads. For an account of the virtues of these substances, see AMBRAGRISEA, SUCCINUM, and PETROLEUM.

1. *Fetid plants.*—Of *artemisia*, *matricaria*, and *cuminum* (see those articles), Dr. Cullen speaks indifferently as to their antispasmodic virtues; none but the last being much known in the present practice.

The *atriplex fœtida*, a plant of remarkable fetor, he presumes, from that, to be a powerful antispasmodic. "Although," says he, "it is not admitted into the list of the London College, it has been frequently employed in this country with advantage; not, however, so frequently as might be expected, as it is a plant, in its fresh state, not always ready at hand, and, in its dry state, it loses all its sensible qualities. It should only be employed in the former state, and the most convenient formula is that of a conserve; but it is not always easy to reconcile our patients to it even in that state; and hence it is not employed so often as I could wish."

Of *rue* (see RUTA), he observes, that the herb and seeds give out essential oils in different quantities, and, he apprehends, of different qualities; but, as it is not marked in what different state of the plant the distillations or extractions have been made, this has produced different reports both of its products and virtues. The analysis, therefore, should be more accurately undertaken; but, from its sensible qualities, and his own experience, Dr. Cullen has no doubt of its antispasmodic powers, when employed in its distilled water, in its conserve, or in its extract. "The distilled water is to be taken from the plant before it has put forth its flowers, and may be much improved by cohobation. The conserve, if made as formerly proposed, with three parts of sugar, is a weak and inconvenient formula; but if prepared with an equal part of sugar only, and made in small quantities, so that the plant may be still taken in its recent state, it is an useful antispasmodic. The extract is certainly an useful medicine, and has the approbation

of both our colleges. It is possible, that it may exert some emmenagogue virtues, though I have not been so successful in employing them as I could wish." One other virtue particularly ascribed to rue, is that of resisting contagion; but this is absolutely without foundation.

Savine (see SABINA), is a plant which, of all others, gives out the greatest proportion of essential oil; and this oil retains the peculiar odour and taste of the plant. In fact, the medicinal virtues of the whole plant may be fairly ascribed to it; but it is very acrid and heating, and, on account of these qualities, scarcely to be employed in the quantity necessary to render it emmenagogue. Nevertheless, it certainly shows a more powerful determination to the uterus than any other plant employed with that view; yet practitioners are frequently disappointed in it, and its heating qualities require a great deal of caution.

2. *Fetid gums.*—*Asafœtida* naturally stands at the head of this list, as being the most powerful of the whole, and, when recent and genuine, a most valuable medicine. This, however, Dr. Cullen says, depends upon the force of its odour, and upon that odour's being of a very diffusible kind, and which, he believes, therefore penetrates the nerves more readily than any other vegetable odour. All this explains its being a powerful and suddenly operating antispasmodic in all hysteric cases; and, when the presence of a paroxysm prevents medicines being taken by the mouth, it is found, when given in clyster, to be very effectual. When taken into the stomach, it is particularly useful in relieving those spasmodic complaints, which so frequently attend dyspepsia; and, as it has manifestly a laxative power, it is well suited to relieve the flatulent colics of hysteric and hypochondriacal patients.

Though in some measure suited to relieve the spasmodic asthma, yet, as the spasm in these cases is of an obstinate kind, asafœtida is seldom found to be of much service in asthmatic attacks. However, as all the fetid gums are determined to the lungs, they promote expectoration, and this is perhaps the most powerful for that purpose, more so, Dr. Cullen thinks, than the ammoniac so frequently employed by practitioners.

Asafœtida, in a solid form, seldom acts powerfully as an antispasmodic; and therefore, except where it is to be joined with aloes or other medicines, it should seldom be employed in that state. Where a sudden operation is required, the form of tincture or volatile spirit are the most proper. As the frequent repetition of the same antispasmodic is apt to weaken its powers, so some variety of formulæ, and of combination with other antispasmodics, may be advisable. The *spiritus volatilis fœtidus* of the Edinburgh College, or the *spiritus ammoniæ fœtidus* of the London, when they can be conveniently given in large doses, are the most powerful formulæ; but much of all this must be left to the discretion of the physician.

Gum ammoniacum, of all the fetid substances of the like nature, has the least of the characteristic odour; and therefore Dr. Cullen considers its antispasmodic powers as the least considerable. It is, however, an acrid and heating substance, which, determined to the lungs, proves a useful expectorant; which is the virtue commonly ascribed to it: but its power is not, even in this view, very remarkable; and, in common practice, the mischief arising from its heating qualities is sometimes greater than the benefit obtained from it as an expectorant.

Galbanum is also a fetid gum, and should have the properties of such; but it is neither of a strong odour nor of diffusible quality, and therefore its virtues are not considerable. By itself it is of little power, but is properly retained in practice, as affording the variety so requisite in the use of this class of remedies.

Opopanax is the least disagreeable of the fetid gums, and has therefore the least antispasmodic virtue. In its separate state it is little employed, nor have its particular virtues been ascertained.

Sagapenum is the most active and powerful substance of the three last mentioned, and has a stronger and more diffusible odour than any of them; Dr. Cullen thinks, therefore, that it has a better title to be retained in practice. Indeed, it comes the nearest to the asafœtida; but it is not so suddenly operative, and is hardly to be otherwise considered of value than as affording a variety in prescription.

3. *Fetid roots.*—The first of these mentioned by Dr. Cullen is the *pæonia*, which became very anciently, and has been since continued as, an article of the materia medica. Since Galen's time, its fate and reputation have been various; while some have commended its virtues extravagantly, others have declared their disappointment in employing it in diseases. Though the sensible qualities of pæonia, in its recent state, promise some virtues, these qualities are very inconsiderable, and at the same time very transitory; so that in the powdered root, the form in which it has been most frequently employed, we can hardly perceive them at all. Dr. Cullen, in the frequent employment of this substance, could never perceive any effect, either in epilepsy or other spasmodic affections; and both the Edinburgh and London Colleges have now omitted it in their lists of the materia medica.

Wild valerian is a root of more virtue and deserved reputation. It has been almost at all times in esteem, and has been much employed in modern practice, frequently with success, but frequently also without any effect at all. As to the latter circumstance, however, it must be observed, that the best remedies may fail in a disease which de-

pends upon a diversity of causes; and another possibility is, that the valerian is frequently employed in an improper condition. As we have it, in different shops and at different times, Dr. Cullen says, he has found the sensible qualities of it to be very different: and he is persuaded, that, unless it be taken up at a proper season of the year, and also properly dried afterwards, it is often a very inert substance. He does not conclude, from its singular power with respect to cats, that it must have peculiar powers with respect to the animal œconomy; but he nevertheless considers the more or less eagerness which cats shew for it, which is different at different times, a good test of its powers in general.

As an antispasmodic, the powers of valerian are very well established, and we may trust to many of the reports that have been given of its efficacy. If it has sometimes failed, we have just now accounted for it, and we may add, that, in almost all cases, it should be given in larger doses than is commonly done. On this footing, it is very useful in epileptic, hysteric, and other spasmodic affections, when given in substance, which is infinitely preferable to the infusion in water.

"The London College," says Dr. Cullen, "have attempted a tincture strongly impregnated; and I have attempted one still stronger, by taking the root in double the quantity, and straining the tincture by a strong expression: and this I have found, in persons who cannot bear a large dose of the menstruum, is a powerful remedy, and suddenly operating. The volatile tincture prescribed by both colleges, is often, as suddenly operating, an effectual remedy, and gives an excellent variety of antispasmodic formulæ; but, whatever may be the efficacy of the valerian, the menstruum here has certainly a share in it."

4. *Essential oils.*—These, though for the most part falling under the class of stimulants, often exert an antispasmodic power. Their effects in this way are most remarkable in the alimentary canal, and especially where the spasm may be supposed to arise from a loss of tone in some portion of the muscular fibres, and when therefore a stimulus, exciting a motion in the other parts of the canal may be of service.

"The antispasmodic power of essential oils," says Dr. Cullen, "is very much confined to these parts, and, except in a very few particulars, they do not show their power with respect to the whole system; or, if they do, it is probably only where the more general or particular affections depend upon a state of the stomach which may be corrected by the operation of antispasmodics applied to it.

"It is very generally the effect of essential oils to be stimulating and heating to the system; and therefore, when any degree of phlogistic diathesis prevails in the system, the use of them of course is to be avoided. Even in some cases of spasmodic affection of the alimentary canal, though some suspicion of phlogistic diathesis remain, the antispasmodic power of essential oils may seem to be necessary; but, in such cases, it is at least desirable to employ the essential oils of the least inflammatory kind. To this purpose, I am of opinion, that the least inflammatory are those of the umbelliferous seeds; that, next to these, are the oils of the verticillated plants; and that the most inflammatory of all are those of the aromatics strictly so called. But this should be farther examined, and more accurately determined.

"*Camphor*, in many respects, may be considered as an essential oil; but its operation upon the human body seems to be very different from that of most others. It is a powerful antispasmodic with respect to the whole system, without being readily heating to it, as I think has been demonstrated above: and I repeat the observation here, for the sake of remarking, that several of the essential oils approach to the nature of camphor, and contain manifestly a portion of it in their composition. It may be therefore supposed, that such camphorated oils may be more powerfully antispasmodic, and at the same time less heating. Such I take to be the case with the peppermint; but whether there are any others containing so large a proportion of camphor as to give them the same qualities with this, and different from the most part of the essential oils, I have not been able to determine."

Empyreumatic oils.—Of these, the most noted for its antispasmodic virtue is the empyreumatic oil of animals, in its rectified state, named the *oleum animale*. See Animal Oil. Vegetables, however, when treated in the same manner, yield an oil endowed with similar properties. We do not however alledge, that any particular advantage is to be got by preferring the vegetable oil, but only that the latter merits equal consideration as a medicine.

Under this head, Dr. Cullen notices a very particular circumstance. "We find," says he, "that a very volatile oil in the several æthers, and a very volatile oil procured, by the common chemical management, from either the fossil, animal, or vegetable kingdoms, do all prove powerful antispasmodics; so it appears to me, that their power is very much in proportion to the volatility to which they are carried; for it is well known, that when their volatility, and with that their antispasmodic power, is carried to the utmost, they are again readily changed by the contact of the air. By this, their colour, odour, and volatility, are much diminished, and with these changes their antispasmodic power is also greatly impaired. Here then is a singular connection between the volatility of oil and our nervous power; but how the former

acts upon the latter we do not at all perceive: and, particularly, how the former, by the loss of its volatility, is brought into a state less suited to the cure of spasmodic affections, we cannot clearly discern.

"We have said above, that these affections depend upon a state of mobility in the energy of the brain; and we would now make another step in alledging, that our volatile oils give, for a certain time, *a steadiness to the energy of the brain*, without *destroying its mobility*, in the same manner as narcotics do." The author adds, that, in some instances, where he could know exactly the period of an epileptic accession, he could, by giving a full dose of empyreumatic oil, prevent such an accession.

6. *Animal substances.*—Of antispasmodics drawn from this source, the first is *musk.* See Moschus.

It is a remarkably odoriferous substance; and this seems to depend upon an essential oil, as it arises with distillation in water. If this may be taken as a proof of the great volatility of this oil, it may be comprehended under the head of those which have their antispasmodic powers depending upon their great volatility. This, however, with regard to musk, must be left to farther experiment.

The powers of this remedy, Dr. Cullen considers entirely depending on its being a very odoriferous matter, which in all cases seems to be powerful in acting upon the human nerves. As, however, we do not as yet know any certain means of extracting its odoriferous parts; so the first thing to be remarked with respect to its medicinal qualities is, that it is more effectual if given in substance rather than in any form of preparation that has yet been attempted. If given in substance, from ten to thirty grains should be exhibited at once, and these must be repeated, at pretty short intervals, till the disease is entirely counteracted.

Great caution is required, in those who administer musk in critical cases, to obtain it genuine and of a powerful scent, as it is only on the latter that we should have any reliance.

The animal substance called *Castor* (see Castoreum), is another of the antispasmodic remedies enumerated by Dr. Cullen. The natural history of this, most people are well acquainted with. It is pretty strongly odoriferous, and somewhat disagreeable; and to this he ascribes its medicinal powers. "It is certainly, on many occasions," says the doctor, "a *powerful antispasmodic*, and has been useful almost in every case requiring such remedies, especially when given in substance, and in large doses, from ten to thirty grains. It has been supposed by some to have somewhat of a narcotic power; but I have never perceived this, except where such effects might be imputed to its removing the spasmodic affections which interrupted sleep. Its medicinal virtues are best extracted by a rectified spirit, as it is probable that this extracts most powerfully the odoriferous oil, upon which the medicinal quality probably depends."

In these sentiments, it may be observed, Dr. Cullen is at variance with the statement of Mr. Alexander (vide Experim. Essays), who took considerable doses of castor without any material sensible effects. Or else, may we be at liberty to suppose, that castor, applied to the stomach when the body is *in health*, may be incapable of any important effect, and yet that the same substance may act beneficially *during the existence of spasm?* This last is contrary to all analogy at least.

The tincture directed by the London College in proof spirit, will give this medicine more conveniently, in a larger dose, than the tincture of the Edinburgh College; but neither of them, Dr. Cullen thinks, can admit of doses of much efficacy, though either may give a medicine to be suddenly diffused in the stomach, and therefore of use in spasmodic affections.

7. *Volatile alkali.*—Though the stimulant is the most remarkable power of these salts, which they show wherever the energy of the brain is weakened, and the action of the heart is languid, they may on this very account be classed with the antispasmodic salts. In such cases their stimulus is among the safest, as it is always transitory; and when their acrimony can be covered, so as to pass the mouth and fauces without irritation there, Dr. Cullen says, they may be given in doses of ten or twenty grains.

These volatile alkaline salts were formerly drawn from various animal substances; but now, from whatever substances they may be extracted, the chemists have brought them to such a degree of purity as renders them hardly different from one another. The *ammonia præparata* of the London Dispensatory, or the *carbonas ammoniæ* of the New Edinburgh, are the purest forms of the volatile alkali, the most free from any adhering animal substances; but, while we prepare a volatile alkali from the bones or other solid parts of animals, there will come into use a volatile salt and spirit that can hardly ever be perfectly free from empyreumatic oil: and it is a question with Dr. Cullen, Whether such an adherence may not give some peculiar quality to these as medicines? He believes it does so, and that the impregnation may render it more antispasmodic, a circumstance of consequence, as both are employed in the spasmodic affections of infants.

"The liquid volatile alkali," says the author, "is commonly employed in its mild state; but, by a distillation of the sal ammoniac with quicklime, the alkali obtained may be in its caustic state. In this state it may be readily joined with spirit of wine, and gives the *spiritus ammoniæ aromaticus* of the Edinburgh Dispensatory, or the *spi-*

ritus ammoniæ of the London. The combination affords an excellent menstruum for dissolving the several fetid substances employed as antispasmodics, and renders them more suddenly diffusible, and perhaps of more effect, in all spasmodic affections.

"The caustic volatile alkali is seldom employed by itself; but, if its acrimony be covered while it passes the mouth and fauces, it may be employed with great safety. Its chief use, however, is when employed externally; and, when smelled at the nose, gives a more powerful stimulus than the mild alkali can do. Its acrimony is so considerable, that, when applied to the skin, it readily irritates, and even inflames it; and may be so managed as to prove an useful stimulant and rubefacient in many cases. But this requires its being blended with a mild expressed oil, in such proportion as to prevent its inflaming too much; and in this state it may be employed with great advantage, and particularly in paralytic cases, with more advantage than the acids."

8. *Æther.*—This fluid is well known. It is an artificial substance, formed by the chemical combination of alkohol with one of the concentrated acids. For a long time we were acquainted with it as formed with the sulphuric only; but we have since learned, that not only the other fossil acids of nitre and sea-salt, but that also the vegetable acid, may be managed so as to form an æther, or an oil of great volatility. All of these preparations seem to be endued with an antispasmodic power; but how far this differs in the different species, is not yet ascertained. They are employed in all spasmodic affections, whether of the whole system or of the alimentary canal; and Dr. Cullen says, the suddenness with which they are diffused gives them great advantages. They are irritating and heating to the parts to which they are immediately applied, in which they resemble camphor; and they resemble this substance also in not being heating to the whole system. They resemble it also in another respect, in being antispasmodic in the case of inflammatory spasm; and thus, by a mode of application commonly known, they relieve the head-ach, or tooth-ach, and also some rheumatic affections. Æther seems also to be endowed with some anodyne virtue; at least this is ascribed to the *spiritus ætheris vitriolici compositus*, or *liquor anodynus mineralis* of Hoffmann, which we take to be the same thing; and Dr. Cullen thinks this supposition very well founded.

The only additional observation which he makes with respect to æther is, that the vitriolic most commonly employed is liable to have some small portion of the sulphuric acid in combination with it; and that, in that case, the virtues of the remedy are proportionably impaired. To render æther therefore a powerful medicine, it is necessary that great pains be taken to free it from the sulphuric acid completely. See ÆTHER.

ANTI'THENAR, (αντιθεναρ; from αντι, *against*, and θεναρ, the *palm of the hand*); a muscle in the foot. See ADDUCTOR POLLICIS PEDIS.

ANTITRA'GICUS MUSCULUS; one of the proper muscles of the ear, whose use is to turn up the tip of the antitragus a little outwards, and to depress the extremity of the antihelix towards it.

ANTITRA'GUS, (from αντι, and τραγος, the *tragus*); an eminence of the outer ear, opposite to the tragus, or thick part.

AN'TRUM HIGHMORIANUM; *antrum genæ*; or *sinus maxillaris pituitarius*; a large cavity in the middle of each superior maxillary bone, between the eye and the roof of the mouth, lined by the mucous membrane of the nose, and first described by an anatomist named *Highmore*.

ANTS, ACID OF. See FORMIC ACID.

APARI'NE, (απαρινη; from ρινη, a *file*; because its bark is rough, and rasps like a file); CLEAVERS, or GOOSE-GRASS; a plant very common in our hedges and ditches. It is the *galium aparine; foliis octonis lanceolatis carinatis scabris retrorsum aculeatis, geniculis venosis, fructu hispido* Linn. The expressed juice has been given with some advantage, as an aperient and diuretic in incipient dropsies; but the character in which it has of late been chiefly noticed, is that of an anticarcinomatous remedy. It is said, that a tea-cup full, gradually increased to half a pint, two or three times a-day, has been known to cure cancers; but Dr. Saunders, of London, tried it without any such beneficial result.

APE'RIENS PALPEBRA'RUM RECTUS. See LEVATOR PALPEBRÆ SUPERIORIS.

APERIENTS, (*aperientia*, from *aperio*, to open); the remedies otherwise named eccoprotics, or laxatives. They are medicines which gently open the bowels; such as *magnesia*, *electuarium è cassia*, *electuarium è senna*, *kali vitriolatum*, *oleum ricini*, &c. Dr. Cullen says: "This term has been used in a vague sense for various medicines which, in whatever manner, dissolve obstruction; as well as for such as increase secretions, though no obstruction exists."

APE'RTOR OCULI. See LEVATOR PALPEBRÆ SUPERIORIS.

APHO'NIA, (αφωνια; from α, priv. and φωνη, the *voice*); a suppression of the power of utterance, without either syncope or coma. It is the genus of disease in the class *locales*, and order *dyscinesiæ*, of Cullen. When it takes place from a tumor of the fauces, or about the glottis, it is termed *aphonia gutturalis*; when from a disease of the trachea, *aphonia trachealis*; and when from a paralysis, or want of nervous energy, *aphonia atonica*.

Thus a loss of voice may proceed from various

causes. If one of the recurrent nerves, which are formed by the *par vagum* and the *nervus accessorius*, and reach the larynx, be cut, the person is capable of only, as it were, a half pronunciation; but, if both be cut, the speech and voice are both lost. The loss of speech happening in hysteric patients is called *aphonia*, but more properly that loss of speech is thus named which depends on some fault of the tongue.

Seeing that the motion of any part is destroyed, or lessened at least, by the interception of the nervous power in its passage thither, and that the nerves destined for the motion of the tongue arise principally from the fifth pair of nerves, it evidently appears, that the seat of this disorder is in the said fifth pair of nerves, and that the immediate cause is a diminution or total destruction of the nervous power in them. Hence a palsy of the tongue, which is either antecedent or subsequent to hemiplectic or apoplectic disorders, demands our utmost attention.

If an aphonia appears alone, it generally bespeaks an approaching hemiplegia, or apoplexy; but, if it succeed these disorders, and is complicated with a weak memory, and a sluggishness of the mental powers, it threatens their return. That aphony usually terminates the best which proceeds from a stagnation of serous humours compressing the branches of the fifth pair of nerves, which run to the tongue; but it is no less afflictive to the patient, and is very obstinate of cure.

Other causes of this disorder are, the striking in of eruptions on the skin, a congestion of blood in the fauces and tongue, obstructed periodical evacuations in plethoric habits, spasmodic affections, worms, a crumb of bread falling into the larynx, fear; too free an use of spirituous liquors; also whatever destroys the ligaments which go from the arytænoid to the thyroid cartilages, will, for a time, destroy the voice.

In aphonia, the prognostics vary according to the existing cause or causes. That species of it which is owing immediately to spasm, soon gives way on the removal of the cause. If a palsy of the tongue be the cause, it is very apt to return, though relieved, but often continues incurable through life.

In attempting the *cure*, we must endeavour first to remove whatever obstructs the influx of the nervous fluid into the tongue, and secondly to strengthen the weak parts. These general intentions, in all cases, being regarded, the particular causes must be removed as follows:

If worms be the cause, antispasmodics may give present relief; but the cure depends on the destruction or expulsion of the animals themselves. In case of a congestion of blood about the head, bleeding with leeches, or cupping, and drastic medicines, are to be used.—That species of aphony which remains after the shock of an hemiplegia or apoplexy, requires blisters to be applied to the nape of the neck; as other means are rarely effectual.—If spasmodic constrictions about the fauces and tongue be the cause, external paregorics are of the greatest service, anodyne antispasmodics may be laid under the tongue, and the feet bathed in water; carminative clysters also are useful.—When a palsy of the tongue produces this complaint, evacuations, according to the patient's habit, must be made, and warm nervous medicines must be externally applied, and internally administered; blisters also should be placed between the shoulders.—In case of repelled cuticular eruptions, sudorifics should be given, and the patient's drink should be warm. The *spiritus ammoniæ succinatus*, or *vinum antimonii tartarisati*, may be employed either in combination with other articles, or by themselves, and given, at proper distances of time, in the patient's drink.

APHRODISIACS, (*aphrodisiaca*, αφροδισιακα; from αφροδισια, *venery*); the medicines which excite a desire for venery, such as the *meloë vesicatorius* Linn. are called aphrodisiacs.

APHTHÆ, (αφθαι; from απτω, *to inflame*); the thrush, a disease to which infants are very subject. It is the *aphtha lactucimen* of Sauvages, and is ranked by Cullen in the class *pyrexiæ*, and order *exanthemata*.

Aphthæ are whitish or ash-coloured pustules, invading the uvula, fauces, palate, tonsils, inside of the cheeks, gums, tongue, and lips. They, for the most part, begin at the uvula, sending forth a glutinous mucus, and the pustules covering all or the greatest number of the parts abovementioned with a thick whitish crust, adhering most tenaciously. This crust does not induce an eschar on the parts on which it lies, by eating into them, but comes off in whole pieces after the pustules have arrived at maturity. This will often happen in a short time, so that the throat and internal parts of the mouth are frequently observed to be clean, which a few hours before were wholly covered with white crusts. Neither is this disease confined to the throat and fauces, but is said to affect the œsophagus, stomach, and all parts of the alimentary canal. Of this however there is no other proof, than that, after a great difficulty of swallowing, there is sometimes an immense quantity of aphthæ evacuated by stool and vomiting, such as the mouth could not be thought capable of containing.

The *aphthose fever* seems to be produced by cold and moisture, as it is found only in the northern countries, and especially in marshy places; yet in them the aphthæ often appear without any fever at all.

There is no symptom by which the coming out of aphthæ can be foretold, though they are common in many fevers; but they themselves are in general a bad symptom, and always signify a very

tedious disorder: the danger denoted by them is in proportion to the difficulty of deglutition; and a diarrhœa accompanying them is likewise bad. This indeed generally carries off old people, when they become affected with aphthæ. The dark-coloured aphthæ also are much more dangerous than such as are of a brown or ash colour; but it is a good sign when the appetite returns, and the dark-coloured ones are succeeded by others of a whiter colour. Neither are those which are unaccompanied with fever so dangerous as the other kind.

In attempting the cure, as aphthæ are seldom a primary disease, we must generally endeavour, to remove the disorder upon which they depend. After this, they will disappear; but in the mean time we are not to neglect applications to the aphthæ themselves, such as detergent gargles, or either of the following from the Pharmacopœia of Guy's Hospital in London.

℞ Boracis in pulv. trit. ʒij.
Aquæ rosæ ℥vj.
Mellis rosæ ℥j. Fiat Gargarisma.

Or,

℞ Decocti hordei ℥xiv.
Mellis rosæ ℥ij.
Acid. vitriol. dilut. ʒiss. Fiat Gargarisma.

Or the *linimentum e borace*, of St. Thomas's may be now and then applied: viz.

℞ Ol. Amygdal. ℥j.
Vitellum ovi unius.
Boracis pulverati ʒj.
Misce fiat linimentum.

Where any of these are applied to the mouths of infants of a very tender age, a proportionable diminution must be made in the stimulating ingredients included in their composition.

A'PIUM, (from *apex*, *a top*, because it has a large head; or else from ηπιος, or απιος, *mild*), SMALLAGE; the *apium graveolens* Linn. Of this vegetable Miller enumerates thirteen species.

Smallage is an umbeliferous plant, with bright-green winged leaves, cut slightly into three-winged portions, serrated about the edges. The seeds are small, oval, plano-convex, furrowed, of a pale brown, or ash colour; the root long, about the thickness of a finger, with a number of fibres of a pale yellowish colour on the outside, and white within. It is biennial, flowers in August, grows wild in rivulets and watery places, and is frequently cultivated in our gardens.

The fresh roots of this plant, when produced in their native watery places, partake in some degree of the quality of those of hemlock, have an unpleasant smell, and bitterish acrid taste; but by drying they lose the greatest part of their ill flavour, and become sweetish. They are reckoned aperient and diuretic, but the seeds are to be preferred for all medical purposes, as these are good carminatives. In distillation the seeds yield an essential oil, and also give out their virtue to spirits of wine so completely, as, on evaporation, to leave a perfect extract.

The cicuta aquatica, growing naturally in the same places, may be mistaken for it; but the two plants may be thus distinguished: the leaves of this cicuta are deeply divided, *quite to the pedicle*, into three long, narrow, sharp-pointed segments; whereas those of *smallage* are only slightly cut into three roundish obtuse segments.

By culture this plant has been much improved, and is known as the CELLERY of our gardens, called *apium sativum*. In this state the roots have an agreeable warm sweetish taste, without any of the offensive flavour of the original smallage: but Ray observes, that if neglected, it will degenerate into its first disagreeable state. However, as by culture this plant is improved for the table, so it is rendered less powerful as a medicine.

The *helcoselinum*, or *hydrocelinum*, called *marsh smallage* is a larger sort, growing also in watery places, and of the same nature as celery.

APIUM GRAVEOLENS; the systematic name for the *apium* of the pharmacopœias. See APIUM.

APIUM PETROSELINUM, common or GARDEN-PARSLEY. It is the *apium hortense*, *fructu ovato*, *striato*, *involucro monophyllo; petalis æqualibus*, *foliolis caulinis linearibus*, *involucris minutis* Linn. This plant is too well known to need a description. The roots are diuretic, and are best in a decoction, which should be drank plentifully. Distilled with water, a small portion of essential oil is obtained: rectified spirit of wine extracts the whole of their virtues, and, after evaporation, leaves a good extract. The leaves are warmer than the roots, and afford more essential oil; but the seeds are the best part of the plant: they are stimulating, carminative, bitter, and diuretic. Three pounds of the seeds yield about an ounce of essential oil, the most part of which sinks in water. The roots are said to be aperient and diuretic, and have been employed with great effect, in apozems, to relieve nephritic pains and obstructions of urine. The bruised leaves have been used, as a discutient poultice to many tumors. Though commonly eaten at table, it has been asserted, (how truly we know not), that in some constitutions they occasion epileptic fits, or at least aggravate them in those subject to the disease.

A'PIUM MACEDO'NICUM; MACEDONIAN PARSLEY; the *bubon macedonicum*, Linn. Of this species of Apium we have only the seeds in the shops. These differ from the common sort in being dark-coloured, and covered with a rough hoari-

ness: their virtues however, are similar to, but weaker than the common sort.

APOCENO'SIS, (αποκενωσις; from απο, and κενοω, *to evacuate)*; a superabundant flux of blood or of some other fluid without pyrexia. It is the name of an order in the class *locales* of Cullen.

APOLE'PSIS, (αποληψις; from απο, and λαμβανω, *to take from)*; an interception, suppression, or retention of urine, or of any other natural evacuation.

APONEURO'SIS, (απονευρωσις; from απο, *from*, and νευρον, a *nerve)*; so called from an erroneous supposition of the ancients, that it was formed by the expansion of a nerve. It is a tendinous expansion, or *fascia*, growing thinner and thinner, till it is lost in the cellular membrane. Instances of these are frequently met with in the human body. The outward muscles of the thigh are bound down by one of these expansions, called the FASCIA LATA, which see.

Dr. Hunter describes the *aponeurosis* as proceeding from the musculus fasciæ latæ, called *membranosus musculus*, on the external part of the thigh, and from the gluteus maximus on the posterior part.

There are other fasciæ, as those of the legs, which like those of the thighs, cover the muscles. The soles of the feet are strong fasciæ, which prevent the flexor muscles of the toes being hurt, when we tread. The fasciæ on the thighs and legs bind down the muscles while in action, and also increase their strength by compressing them.

When matter is formed immediately under any of the fasciæ, it cannot point where it was first formed, but runs under them to some distance, in attempting to gain an exit. To prevent inconveniences from this cause, as soon as matter can be felt under a fascia, it is right to give it vent immediately, and not to wait for its pointing, as in other situations. When this happens under the aponeurosis of the temporal muscle, great difficulties attend the case. See TEMPORALIS MUSCULUS.

APO'PHYSIS, (αποφυσις; from απο, and φυω, *to grow)*; any process of a bone, as the nasal apophysis of the frontal bone, &c.

APOPHLEGMATIZONTA, a name for the class of medicines otherwise termed Masticatories. See MASTICATORIES.

APOPLE'XIA, (from αποπλησσω, *to strike or knock down)*; the APOPLEXY. When it is slight it is called *parapoplexia*.

Dr. Cullen ranks this genus of disease in the class *neuroses*, and order *comata*. He defines it a diminution commonly of all voluntary motion, attended with sleep, more or less sound, the motion of the heart and arteries still continuing; to which may be added an oppressed respiration, and frequently a snorting. Sauvages makes fifteen species.—*Nosolog. Method. vol.* ii. *p.* 845. Dr. Cullen reduces them to nine.—*Synopsis. Nosol. Meth. vol.* ii. *p.* 183, &c. viz. 1st. *Apoplexia sanguinea*, with signs of an universal plethora, and chiefly fulness in the head. Here come the *carus à frigore* et *spontaneus; cataphora coma*. 2d. *Apoplexia serosa*, which happens generally in aged and leucophlegmatic people; *carus à hydrocephalo*. 3d. *Apoplexia hydrocephalica;* usually named *hydrocephalus*. 4th. *Apoplexia atrabilaria*, observed in persons disposed to melancholy. 5th. *Apoplexia traumatica;* when the head is hurt by external violence. 6th. *Apoplexia venenata*, from strong sedatives, whether externally applied, or internally taken. *Carus ab insolatione, carus à frigore*, &c. 7th. *Apoplexia mentalis; carus à pathemate*, from passions of the mind. 8th. *Apoplexia cataleptica*, in which the respiration is not stertorous; and though the limbs maintain any accidental position, yet they give way to external force applied to them. 9th. *Apoplexia suffocata*, which happens from any external suffocating power; as in cases of hanging and drowning.

Dr. Cullen considers the *carus; cataphora; coma; hæmorragia cerebri; catalepsis; cerebri affectio spasmodica—ecstatica;* and the *ecstasis*, as apoplexies; and the *typhomania*, and *lethargus*, as symptomatic apoplexies. And often, besides these, there is a symptomatic apoplexy arising from *intermittent fever; continued fever; inflammation; exanthema; hysteria; epilepsy; gout; worms; ischuria; scurvy;* for specifications of which see the work referred to above. There are also a number of species of Asphyxia which come properly under this head. See ASPHYXIA.

To the definition of *apoplexy*, he adds, that the abolition of the powers of sense and motion is in some degree only; meaning by this to imply, that under the title of *apoplexy* are comprehended those diseases, which, as differing from it in degree only, cannot, with a view either to pathology or practice, be properly distinguished from it; and such are the diseases named above.

Dr. Cullen thinks that *the proximate cause* of apoplexy, in general, is whatever interrupts the motion of the nervous power, whether from the brain or to it. Of *apoplexies from internal causes*, he thinks the motion of the nervous power is interrupted by some compression on the origin of the nerves; and this compression is occasioned by an accumulation of blood in the veins of the head. In *apoplexies from external causes*, the motion of the nervous power is interrupted by directly destroying its mobility; as when mephitic air, fumes from charcoal, &c. are admitted to the nerves. We shall consider separately the affections that fall under both these heads.

1. *Sanguineous Apoplexy.*—In this disease the patients fall suddenly down, and are deprived of all sense and voluntary motion, but without convulsions. A giddiness of the head, noise in the ears, corruscations before the eyes, and redness of the face, usually precede. The distinguishing symptom

of the disease is a deep sleep, attended with violent snorting; if any thing be put into the mouth, it is returned through the nose; nor can any thing be swallowed without shutting the nostrils; and even when this is done, the person is in the utmost danger of suffocation. Sometimes apoplectic patients will open their eyes after having taken a large dose of an emetic; but if they show no sign of sense, there is not the least hope of their recovery. Sometimes the apoplexy terminates in an hemiplegia; in which case it comes on with a distortion of the mouth towards the sound side, a drawing of the tongue the same way, and stammering of the speech. Dissections sometimes show a rupture of some vessels of the meninges, or even vessels of the brain itself; though sometimes, if we may believe Dr. Willis, no defect is to be observed either in the cerebrum or cerebellum.

The general *cause* of a sanguineous apoplexy is a plethoric habit of body, with a determination to the head. The disease therefore may be brought on by whatever violently urges on the circulation of the blood; such as surfeits, intoxication violent passions of the mind, immoderate exercise, &c. It takes place, however, for the most part, when the venous plethora has subsisted for a considerable time in the system. For that reason it commonly does not attack people till past the age of sixty; and that whether the patients are corpulent and have a short neck, or whether they are of a lean habit of body. Till people are past the age of childhood, apoplexy never happens.

This disease very often kills at its first attack; and few survive a repetition of the fit; so that those who make mention of people who have survived several attacks of the apoplexy, have probably mistaken the epilepsy for this disease. In no disease is the prognosis more fatal; since those who seem to be recovering from a fit, are frequently and suddenly carried off by its return, without either warning of its approach or possibility of preventing it. The good signs are when the disease apparently wears off, and the patient evidently begins to recover; the bad ones are when all the symptoms continue and increase.

The great object to be aimed at, is to restore the connection between the sentient and corporeal parts of the system: and when interruption to this connection proceeds from compression of the brain by blood, this is to be attempted, in the first place, by large and repeated bleedings from the jugular veins and temporal arteries, and also by cupping. Blisters should be applied to the head or between the shoulders; after which, the same internal remedies are to be used as in the serous apoplexy, after mentioned. The body is to be kept in a somewhat erect posture, and the head supported in that situation.

2. *Serous Apoplexy.*—In this species the pulse is weak, the face pale, and there is a diminution of the natural heat. On dissection, the ventricles of the brain are found to contain a larger quantity of fluid than they ought; the other symptoms are the same as in the former.

This may arise from any thing which induces a debilitated state of the body, such as depressing passions of the mind, much study, watching, &c. It may also be brought on by a too plentiful use of diluting, acidulated drinks. It does not, however, follow, that the extravasated serum abovementioned in the ventricles of the brain is always the cause of the disease, since the animal humours are very frequently observed to ooze out in plenty through the coats of the containing vessels after death, though no extravasation took place during life.

This species is equally fatal with the other; and what has been said of the prognosis of the sanguineous, may also be said of that of the serous apoplexy.

In this species venesection can scarcely be admitted: acrid purgatives, emetics, and stimulating clysters, are recommended to carry off the superabundant serum; but in bodies already debilitated, they may perhaps be liable to the same exceptions with venesection itself.

Dr. George Fordyce thinks that the compression producing apoplexy seldom or never arises from the serous part of the blood being extravasated; but adds whether blood or serum be the cause, the same methods must be pursued for relief; and besides bleeding, to relieve the brain, he urges the advantage of purging, which he says diminishes the circulation from the brain as well as from the intestines. He recommends the more active purgatives, and to repeat them so as to keep up the secretion that way.

Dr. Saunders, physician of Guy's Hospital, in London, recommends the following:

℞ Extract. Colocynth. comp. gr. xv.
Calomelan. gr. iij.
Ol. essential. piment. gtt. ij.
Sint pilulæ iv. primo mane sumendæ.

℞ Colocynthid. ʒj.
Aquæ fervent. ℥x.
Coque per sextam horæ partem, et liquori colato adhuc tepido, admisce
Syr. e spina cer. ℥j. ut fiat enema statim injiciendum.

℞ Infus. sennæ tartaris. ℥ij.
Tinct. jallap.
Syr. spin. cervin. sing. ʒij. Misce hauriatur pro dosi.

℞ Ari rad. recent.
Arab. gum. pulv. sing. ℈iv.
Sperm. ceti ℈ij.

Aq. pulegii ℥viiss.
Syr. simpl. ʒiij.
Terendo in mortario marmoreo fiat Emulsio, cujus capiat cochlearia duo vel tria bis terve indies.

Volatile salts, cephalic elixirs, and cordials, are also prescribed; and in case of a hemiplegia supervening, the cure is to be attempted by aperient ptisans, cathartics, and sudorifics; gentle exercise, as riding in a carriage; with blisters and such stimulating medicines as are in general had recourse to in affections originally of the paralytic kind.

Dr. Hugh Smith offers the following formulæ, to be adopted according to circumstances. He says, the *pituitous* apoplexy requires a very different treatment from the *sanguineous:* blood-lettings must be either entirely omitted, or very sparingly used; as the intention of cure will consist "in attenuating the pituitous lentor, promoting its absorption, and expelling it from the body."

The stronger emetics, and warm, smart purgatives will be adviseable, with sternutatories, and a liberal use of blisters to the head, back, and extremities, and sinapisms, or strongly stimulating applications to the feet.

The aromatic, stimulating, and warm cephalic and nervous medicines, he alledges, bid, of all others, the fairest to relieve the patient.

℞ Antim. tartar. gr. iij.
Pulv. rad. ipecacuanhæ, ℈ſs.
M. ft. pulv. emetic.

℞ Tinct. alo. comp. ℥ij.
Tinct. jalap. ʒiij.
Sp. Lavend. ʒſs.
M. ft. haustus mane sumendus, et pro re nata repetendus.

℞ Fol. Tabaci ʒij.
Pulp. colocynth. ʒſs.
Coq. ex aquæ fontanæ q. s. ad colatur. ℥viij.
Adde Syr. e spin. cerv. ℥jſs.
M. ft. enema pro re nata injiciendum.

℞ Rad. hellebor. alb. in pulv. trit.
Folior. asari, aa ʒj.
Hydrarg. vitriolat. gr. vj.
M. ft. pulv. sternutator. cujus paucill. subinde usurpetur.

℞ Lact. ammoniac. ℥j.
Aq. cinnam. ten. ʒvj.
Sp. vol. fœtid. ʒj.
M. ft. haust. sexta quaque hora sumendus.

℞ Pulv. ari comp. ʒſs.
Pulv. aromatic. gr. vj.
Ol. lavend. gtt. j.
Syr. zingib. q. s.
Fiat. bol. ter quaterve de die sumend.

℞ Castor. russ. ℈j.
Pulv. aromatic. ℈ſs.
M. ft. pulv. sexta quaque hora sumend. ex julep. seq. coch. iv.

℞ Aq. Pulegii simp. ℥vj.
Tinct. valerian. vol. ℥j.
Syr. croci, ʒvj.
Misce fiat julepium.

When the symptoms are relieved, a large spoonful of mustard seed may be swallowed morning and evening; and the stomach purges may be continued for some time, to prevent a relapse.

The Doctor enumerates a third species which he denominates the spasmodic apoplexy. This is to be relieved, by relaxing the spasm, and promoting a free circulation through the vessels of the encephalon. The remedies recommended for the relief of a pituitous apoplexy, will be conducive to these purposes. Blood-letting, if necessary; afterwards an emetic, with a blister to the head, and sinapisms to the feet, and warm nervous remedies, will bid the fairest to answer the intention.

3. *Hydrocephalic Apoplexy,*—or *Dropsy* of the *Brain.* See HYDROCEPHALUS.

4. *Atrabiliary Apoplexy.*—This takes place in the last stage of the diffusion of bile through the system, *i. e.* in what is termed the black jaundice. In some cases the brain, on dissection, has been found tinged quite brown. It cannot be thought to admit of any cure, at least none is proposed by Dr. Cullen.

5. *Apoplexy from External Violence.*—This is the *Apoplexia traumatica,* and *Carus traumaticus,* of Sauvages. The treatment of this disease, as it arises from external injury, exclusively falls under the management of the surgeon. See BRAIN, CONCUSSION, &c.

6. *Apoplexy from Poisons.*—The poisons producing apoplexy may be either of the stimulant or sedative kind, as spirituous liquors, opium, and the more virulent kinds of vegetable poisons. The vapours of mercury, or of lead, in great quantity, will sometimes produce a similar effect; though commonly they rather produce a paralysis, and operate slowly. The vapour of charcoal, or carbonic gas, in any form, breathed in great quantity, also produce an apoplexy, or a state very similar to it; and even cold itself produces a fatal sleep, though without the apoplectic snorting. To enumerate all the different symptoms which affect the unhappy persons who have swallowed opium, or any of the stronger vegetable poisons, is impossible, as they are scarce to be found the same in any two patients.

The state induced by them seems to differ somewhat from that of a true apoplexy; as it is commonly attended with convulsions, but has the particular distinguishing sign of apoplexy, namely, a very difficult breathing, or snorting, more or less violent according to the nature of poisonous matter swallowed.

(1.) Of the poisonous effects of CARBONIC GAS, or fixed air, Dr. Percival gives the following account. "All these *noxious vapours*, whether arising from burning charcoal, the fermenting grape, the Grotto di Cani, or the cavern of Pyrmont, operate nearly in the same manner. When accumulated and confined, their effects are often instantaneous; they immediately destroy the action of the brain and nerves, and in a moment arrest the vital motions. When more diffused, their effects are slower, but still evidently mark out a direct affection of the nervous system.

"Those who are exposed to the vapours of the *fermenting grape*, are as instantly destroyed as they would be by the strongest electrical shock. A state of insensibility is the immediate effect upon those animals which are thrust into the Grotti di Cani, or the cavern of Pyrmont: the animal is deprived of motion, lies as if dead; and if not quickly returned into the fresh air, is irrecoverable. And if we attend to the histories of those who have suffered from the vapours of burning charcoal, we shall in like manner find, that the brain and moving powers are the parts primarily affected.

"A cook who had been accustomed to make use of lighted *charcoal* more than his business required, and to stand with his head over these fires, complained for a year of very acute pain in the head; and after this, was seized with a paralytic affection of the lower limbs, and a slow fever.

"A person was left reading in bed with a pan of charcoal in a corner of the room. On being visited early the next morning, he was found with his eyes shut, his book open and lying on one side, his candle extinguished, and to all appearance like one in a deep sleep. Stimulants and cupping-glasses gave no relief; but he was soon recovered by the free access of fresh air.

"Four prisoners, in order to make their escape, attempted to destroy the iron-works of their windows, by the means of burning charcoal. As soon as they commenced their operations, the fumes of the charcoal being confined by the closeness of the prison, one of them was struck dead; another was found pale, speechless, and without motion; afterwards he spoke incoherently, was seized with a fever, and died. The other two were with great difficulty recovered.

"Two boys went to warm themselves in a stove heated with charcoal. In the morning they were found destitute of sense and motion, with countenances as composed as in a placid sleep. There were some remains of pulse; but they died in a short time.

"A fisherman deposited a large quantity of charcoal in a deep cellar. Some time afterwards his son, a healthy strong man, went down into the cellar with a pan of burning charcoal and a light in his hand. He had scarcely descended to the bottom when his candle went out. He returned, lighted his candle, and again descended. Soon after, he called aloud for assistance. His mother, brother, and a servant, hastened to give him relief; but none of them returned. Two others of the village shared the same fate. It was then determined to throw large quantities of water into the cellar; and after two or three days, they had access to the dead bodies.

"Cœlius Aurelianus says, that those who are injured by the fumes of charcoal become cataleptic. And Hoffman enumerates a train of symptoms which in no respect correspond with his idea of suffocation. Those who suffer from the fumes of burning charcoal, says he, have severe pains in the head, great debility, faintness, stupor, and lethargy.

"It appears from the above histories and observations, that these vapours exert their noxious effects on the brain and nerves. Sometimes they occasion sudden death; at other times, the various symptoms of a debilitated system, according as the poison is more or less concentrated. The olfactory nerves are first and principally affected, and the brain and nervous system by sympathy or consent of parts. It is well known, that there is a strong and ready consent between the olfactory nerves and many other parts of the nervous system. The effluvia of flowers and perfumes in delicate or irritable habits, produce a train of symptoms, which, though transient, are analogous to those which are produced by the vapours of charcoal; viz. vertigo, sickness, faintness, and sometimes a total insensibility. The female malefactor, whom Dr. Mead inoculated by putting into her nostrils dossils of cotton impregnated with variolous matter, was, immediately on the introduction, afflicted with a most excruciating headach, and had a constant fever till after the eruption.

"The vapours of burning charcoal, and other poisonous effluvia, frequently produce their prejudicial and even fatal effects, without being either offensive to the smell, or oppressive to the lungs. It is a matter of importance, therefore, that the common opinion should be more agreeable to truth; for where suffocation is supposed to be the effect, there will be little apprehension of danger, so long as the breast keeps free from pain or oppression.

"It may be well to remember, that the poison itself is distinct from that gross matter which is

offensive to the smell; and that this is frequently in its most active state when undistinguished by the sense. Were the following cautions generally attended to, they might in some instances be the happy means of preserving life. Never to be confined with burning charcoal in a small room, or where there is not a free draught of air by a chimney or some other way. Never to venture into any place in which air has been long pent up, or which from other circumstances ought to be suspected; unless such suspected place be either previously well ventilated, or put to the test of the lighted candle. For it is a singular and well-known fact, that the life of flame in some circumstances is sooner affected and more expeditiously extinguished by noxious vapours, than animal-life. A proof of this I remember to have received from a very intelligent clergyman, who was present at a musical entertainment in the theatre at Oxford. The theatre was crowded; and during the entertainment, the candles were observed to burn dim, and some of them went out. The audience complained only of a faintness and languor; but had the animal effluvia been still further accumulated, or longer confined, they would have been extinguished as well as the candles.

"The most obvious, effectual, and expeditious means of relief to those who have unhappily suffered from this cause, are such as will dislodge and wash away the poison, restore the energy of the brain and nerves, and renew the vital motions. Let the patient be, therefore, immediately carried into the open air, and let the air be fanned backwards or forwards to assist its action: let cold water be thrown on the face; let the face, mouth, and nostrils be repeatedly washed; and as soon as practicable, get the patient to drink some cold water. But if the case be too far gone to be thus relieved, let a healthy person breathe into the mouth of the patient; and gently force air into the mouth, throat, and nostrils. Frictions, cupping, bleeding, and blisters, are likewise indicated. And if, after the instant danger is removed, a fever be excited, the method of cure must be adapted to the nature and prevailing symptoms of the fever."

(2.) With regard to the *poison of* Opium, Dr. Mead advises what appear to us very insufficient remedies; since, without the opium can be evacuated before it has rendered the stomach insensible to the stimulus of an emetic, nothing yet known can prevent a fatal event. He describes the following method of cure. Besides evacuations by vomiting, bleeding, and blistering, acid medicines and lixivial salts are proper. These, he says, contract the relaxed fibres, and by their diuretic force cause a depletion of the vessels. Dr. Mead says, he gave repeated doses of a mixture of salt of wormwood and juice of lemons, with extraordinary success; but that nothing is of greater consequence, than to use proper means for the prevention of sleep, by rousing and stirring the patient, and forcing him to walk about; for if he be once permitted to fall into a sound sleep, it will be found altogether impossible to awake him.

(2.) Of a nature nearly akin to the poison of opium seems to be that of Laurel-water, a simple water distilled from the leaves of the lauro-cerasus or common laurel. The bad effects of this were first observed in Ireland, where it had been customary to mix it with brandy for the sake of the flavour; and thus two women were suddenly killed by it. This gave occasion to some experiments upon dogs, in order to ascertain the malignant qualities of the water in question; and the event was as follows: All the dogs fell immediately into totterings and convulsions of the limbs, which were soon followed by a total paralysis, so that no motion could be excited even by pricking or cutting them. No inflammation was found upon dissection, in any of the internal membranes. The most remarkable thing was a great fullness and distension of the veins, in which the blood was so fluid, that even the lymph in its vessels was generally found tinged with red. The same effects were produced by the water injected into the intestines by way of clyster.

To make the experiment more fully, Dr. Nicholls prepared some of this water so strong, that about a drachm of heavy essential oil remained at the bottom of three pints of it, which by frequent shaking was again quite incorporated with it. So virulent was this water, that two ounces of it killed a middle-sized dog in less than half a minute, even while it was passing down his throat. The poison appeared to reside entirely in the abovementioned essential oil, which comes over by distillation, not only from the leaves of laurel, but from some other vegetables; for ten drops of a red oil distilled from bitter almonds, when mixed with half an ounce of water, and given to a dog, killed him in less than half an hour.

Volatile alkalies are said to be an antidote to this poison; of which Dr. Mead gives the following instance. About an ounce of strong laurel-water was given to a small dog. He fell immediately into the most violent convulsions, which were soon followed by a total loss of motion. When he seemed to be expiring, a vial of strong spirit of sal ammoniac was held to his nose, and a small quantity of the same forced down his throat: he instantly felt its virtue; and by continuing the use of it for some time, he by degrees recovered the motion of his legs; and in two hours walked about with tolerable strength, and was afterwards quite well.

(4.) With regard to the fatal effects of Cold, there is no other way of counteracting them but

by the application of external heat. We are apt to imagine, that the swallowing considerable quantities of ardent spirits may be a means of making us resist the cold, and preventing the bad effects of it from arising to such a height as to destroy life: but these do not appear to be in the least possessed of any such virtue in those countries liable to great excesses of cold. On the contrary, the Peruvian bark, joined with aromatics, by strengthening the solids, as well as increasing the motion of the fluids, is found to answer better than any other thing as a preservative: but when the pernicious effects have already begun to discover themselves, nothing but increasing, by some means or other, the heat of the body, can possibly be depended upon: and even this must be attempted with great care; for as, in such cases, there is generally a tendency to mortification in some of the extremities, the sudden application of heat will certainly increase this tendency to such a degree as to destroy the parts. But the external treatment of such mortifications belongs to Surgery.

7. *Mental Apoplexy.*—Apoplexy from violent passions of the mind, may be either sanguineous or serous, though it is more commonly of the former than the latter species. The treatment is the same in either case. Or the symptoms may partake of the nature of catalepsy; in which case the method of treatment is the same with that of the genuine catalepsy.

8. *Cataleptic Apoplexy.*—This disease, though not improperly placed, by Dr. Cullen, amongst the apoplexies, has, nevertheless, so many peculiarities as to entitle it to a separate consideration; we shall, therefore, describe it under CATALEPSIS.

9. *Apoplexy from suffocation.*—The asphyxia suspensorum, and asphyxia immersorum of Sauvages. This is that kind of apoplexy which takes place in those who are hanged or drowned. See the articles DROWNING, RESUSCITATION, &c.

Besides the species above mentioned, the apoplexy is a symptom in many other affections, such as fevers, both continued and intermitting, exanthemata, hysteria, epilepsy, gout, worms, ischuria, and scurvy, as has been observed above.

APOSTE'MA, (αποστημα; from αφιστημι, to *recede*); a term given by the ancients to abscesses in general. See ABSCESS.

APOTHECARIUS, (from απο, *cum*, *with*, and τιθημι, *pono*, *to put*); an apothecary, so called from his employ being to prepare, and keep in readiness, the various articles of the Materia Medica; and to compound them according to the physician's direction. In every European country except Great Britain, the apothecary is the same as, in England, we name Druggist and Chemist.

In London, the apothecaries are one of the city-companies. They were incorporated by a charter from king James I. procured at the solicitation of Dr. Mayerne and Dr. Aitkins: till that time they only made a part of the grocers' company; plums, sugar, spice, Venice treacle, mithridate, &c. were sold in the same shop and by the same person. The design of separating them was, obviously, in order that medicines might be better prepared; and in opposition to many ignorant persons who imposed unwholesome remedies on the public. By an act which was made perpetual in the ninth year of George I. they are exempted from serving upon juries, or in ward and parish offices. They are obliged to make up their medicines according to the formulæ prescribed in the college dispensatory; and are liable to have their shops visited by the censors of the college, who are empowered to destroy such medicines as they think are not good; but this power is not exercised properly.

"On the knowledge, skill, and fidelity of the apothecary" says the late, and much regretted Dr. Percival, "depend, in a very considerable degree, the reputation, the success, and usefulness of the physician; and as these qualities justly claim his attention and encouragement, the possessor of them merits his respect and patronage.

"The apothecary is, in almost every instance, the præcursor of the physician; and being acquainted with the rise and progress of the disease, with the hereditary constitution, habits, and disposition of the patient, he may furnish every importent information. It is in general, therefore, expedient, and when health or life are at stake, expediency becomes a moral duty, to confer with the apothecary, before any decisive plan of treatment is adopted; to hear his account of the malady, of the remedies which have been administered, of the effects produced by them, and of his whole experience concerning the *juvantia* and *lædentia* in the case. Nor should the future attendance of the apothecary be superseded by the physician; for if he be a man of honour, judgment, and propriety of behaviour, he will be a most valuable auxiliary through the whole course of the disorder, by his attention to varying symptoms; by the enforcement of medical directions; by obviating misapprehensions in the patient, or his family; by strengthening the authority of the physician; and by being at all times an easy and friendly medium of communication. To subserve these important purposes, the physician should occasionally make his visits in conjunction with the apothecary, and regulate by circumstances the frequency of such interviews: for if they be often repeated, little substantial aid can be expected from the apothecary, because he will have no intelligence to offer which does not fall under the observation of the physician himself; nor any opportunity of executing his *peculiar* trust, without becoming burthensome to the patient by multiplied calls, and unseasonable assiduity."

In consequence of this amicable *intercourse* and *co-operation* of the physician and apothecary, the latter will regard the free communication of the physician as a privilege and mean of improvement; he will have a deeper interest in the success of the curative plans pursued; and his reputation will be directly involved in *the purity and excellence of the medicines he dispenses.* But to guard against the abuses unfortunately too prevalent, Dr. Percival says: "the duty and responsibility of the physician, however, are so intimately connected with these latter points, that no dependence on the probity of the apothecary, should prevent the occasional *inspection of the drugs*, which he prescribes. In London, the law not only authorizes, but enjoins a stated examination of the simple and compound medicines kept in the shops. And the policy that is just and reasonable in the metropolis, must be proportionally so in every provincial town, throughout the kingdom. Nor will any respectable apothecary object to this necessary office, when performed with delicacy, and at seasonable times; since his reputation and emolument will be increased by it, probably in the exact *ratio*, thus ascertained, of professional merit and integrity."

Of so valuable a class of men as the country apothecaries, the author observes, no opportunities should be neglected of promoting the improvement, or of contributing to their stock of knowledge, by unreserved information on medical subjects. He insists, that, when such occasions present themselves, "*the worst avarice is that of sense*;" for practical improvements usually originate in towns, and often remain unknown or disregarded in remote country situations.

A great political and moral writer, Dr. Adam Smith, has the following passage.—"Apothecaries' profit," says he, "is become a bye-word, denoting something uncommonly extravagant. This great apparent profit, however, is frequently no more than the reasonable wages of labour. The skill of an apothecary is a much nicer and more delicate matter than that of any artificer whatever; and the trust which is reposed in him is of so much greater importance. He is the physician of the poor in all cases, and of the rich when the distress or danger is not very great. His reward, therefore, ought to be suitable to his skill and his trust, and it arises generally from the price at which he sells his drugs. But the whole drugs which the best employed apothecary, in a large market town, will sell in a year, may not perhaps cost him above thirty or forty pounds. Though he should sell them, therefore, for three or four hundred, or a thousand per cent. profit, this may frequently be no more than the reasonable wages of his labour, charged in the only way in which he can charge them, upon the price of his drugs." "The statement here given," continues Dr. Percival, "exceeds the emoluments of the generality of apothecaries, in country districts. And a physician, who knows the education, skill, and persevering attention, as well as the sacrifice of ease, health, and sometimes even of life, which this profession requires, should regard it as a duty not to withdraw, from those who exercise it, any sources of reasonable profit, or the honourable means of advancement in fortune. Two practices prevail in some places injurious to the interest of this branch of the faculty, and which ought to be discouraged. One consists in suffering prescriptions to be sent to the druggist, for the sake of a small saving in expence: the other in receiving an annual stipend, usually degrading in its amount, and in the services it imposes, for being consulted on the slighter indispositions to which all families are incident, and which properly fall within the province of the apothecary."—

"When the aid of a physician is required, the apothecary to the family is frequently called upon to recommend one. It will then behove him to learn fully whether the patient or his frends have any preference or partiality; and this he ought to consult, if it lead not to an improper choice. For the maxim of Celsus is strictly applicable, on such an occasion; *Ubi par scientia, melior est amicus medicus quam extraneus.* But if the parties concerned be entirely indifferent, the apothecary is bound to decide according to his best judgment, with a conscientious and exclusive regard to the good of the person, for whom he is commissioned to act. It is not even sufficient that he selects the person on whom, in sickness, he reposes his own trust; for in this case friendship justly gives preponderancy; because it may be supposed to excite a degree of zeal and attention, which might overbalance superior science or abilities. Without favour or regard to any personal, family, or professional connections, he should recommend the physician whom he conscientiously believes, all circumstances considered, to be best qualified to accomplish the recovery of the patient."

In the English metropolis and also in some of the larger towns, benevolent institutions have been formed, for the relief of the widows and children of apothecaries, and other members of the medical profession who have become indigent. Such schemes merit the sanction and encouragement of every liberal physician and surgeon; and were they sufficiently extended, their usefulness would be greatly increased, and their permanency almost with certainty secured. Medical subscribers, Dr. Percival thinks, from every part of Great Britain, should be admitted, if they offer satisfactory testimonials of their qualifications. One comprehensive establishment seems to be more eligible than many on a smaller scale. For it would be conducted with

superior dignity, regularity, and efficiency; with fewer obstacles from interest, prejudice, or rivalship; with considerable saving in the aggregate of time, trouble, and expence; with more accuracy in the calculations relative to its funds, and consequently with the greater extension of its dividends to those who need assistance.

APOZEM (αποζημα; from αποζεω, *to boil*); another name for a decoction. See Decoction.

APPARATUS (*apparatus*, Lat.) a collection of instruments, implements, or contrivances, necessary to be used in carrying into execution any intended work or process. Thus the instruments of the surgeon, prepared and in readiness for an operation, are his *apparatus;* as are also those employed in chemistry and natural philosophy. See Instruments, Chemical Apparatus, Pneumatic Apparatus, Pharmaceutical Apparatus, &c.

APPENDI'CULA VERMIFO'RMIS, or appendicula cœci (from *appendo*, *to hang from; vermis*, *a worm;* and *forma*, *a shape).* On one side of the inferior part of the cœcum lies an appendix resembling a small intestine, nearly of the same length with the cœcum, but more slender. It is called *vermiformis*, from its resemblance to an earth-worm. Its common diameter is about a quarter of an inch. By one extremity it opens into the bottom of the cœcum, the other extremity is closed. Its structure is like that of the intestines in general; its internal coat is folliculous, like that of the duodenum, and is reticular too. Its use is not known: it is also called *additamentum coli.*

APPENDI'CULÆ EPIPLO'ICÆ, or Appendices Coli Adiposæ; those small appendices of the colon and rectum, in the human subject, which are filled with adipose substance. See Intestines.

APPETITE, a certain craving or uneasy sensation in the stomach, always accompanied with a desire to eat or drink. An excessive appetite is called by physicians bulimia, or *fames canina;* a defect or loss of it, anorexia; and that after things improper for food, pica. See those articles. The loss of appetite is a symptom of Dispepsia. See Dispepsia.

APPLE, COMMON THORN. See Stramonium.

APPLES. The common crab tree, *pyrus malus* of Linnæus, is the stock from whence are produced all the varieties of apples at present cultivated. Apples, in general, when ripe, afford a pleasant and easily digestible fruit for the table; but, when the stomach is weak, they are very apt to remain unaltered for some days, and to produce dyspepsia. Sour fruits are to be considered as unwholesome, except when boiled or baked, and rendered soft and mellow by the addition of sugar. Dr. Cullen says he has known portions of sour apple brought up after having been swallowed two days.

APPLICATION, any medicinal form of remedy externally used, whether it be permanent or occasional. Thus a collyrium is an *application* to the eyes; an ointment, to an ulcer; &c.

APRICOT; the fruit of the *prunus armeniaca* Linn. When full ripe they are easily digested, and are considered as a pleasant and nutritious delicacy for the table. See Drupacea.

APYRE'XIA (απυρεξια, from α, priv. and πυρεξια, a *fever);* apyrexy; without, or unattended with, fever. The intermission of feverish heat. It is a term used by Dr. Cullen.

APYRI'NÆ (from *apyrinus*, *without stone* or *kernel*, or a small one, from the Greek, α, privativ. and πυρην, *nucleus*, a kernel); the name of the fifty-third class in Gerard's Arrangement of the Plants that are natives of Provence, in France. It consists of two genera, the myrtle and pomegranate.

APYROUS; a word applied to denote that property of some bodies, by which they resist the most violent fire without any sensible alteration. Apyrous bodies ought to be distinguished from those which are refractory. Refractory substances are those which cannot, by violent heat, be fused, whatever other alteration they may sustain. But a body, properly speaking, apyrous, can neither be fused by heat, nor can undergo any other change. Diamonds were long thought to be possessed of this property. But some late experiments have shown, that diamonds may be entirely dissipated or evaporated by heat, and are, therefore, not entitled to be ranked among apyrous substances. Perhaps there is no body in nature essentially and rigorously apyrous. But it is sufficient that there be bodies apyrous relatively to the degree of fire which art can produce, to entitle them to that name.

A'QUA, water. See the articles Water, and Cold affusion.

AQUA AERIS FIXI; water impregnated with carbonic acid gas or fixed air. This is directed, by the Dublin College, to be prepared in the common way, with a Nooth's apparatus; but Mr. Paul has a method of causing water to imbibe six times its bulk of the gas, by the force of pressure. See Acidulous waters.

AQUA ALUMINIS COMPOSITA, formerly called *aqua aluminosa Bateana.* This preparation is employed externally as a detergent. It forms a useful collyrium if properly diluted, and is an excellent injection for the cure of fluor albus,

It is prepared in the following way:

Aqua Aluminis Composita. Lond.

Take of Alum,
Vitriolated zinc, of each half an ounce;
Boiling distilled water, two pints.

Pour the water on the salts in a glass vessel, and strain the solution.

AQUA AMMONIÆ, the old *spiritus salis ammoniaci.* This preparation is called *carbonas ammoniacæ liquidus*, in the new chemical nomenclature. See AMMONIAC.

AQUA AMMONIÆ ACETATÆ; *acetatis ammoniacalis;* or *spiritus mindereri.* This preparation is called *acetis ammoniacæ liquidus*, in the new chemical nomenclature; it being a natural salt by solution, formed by the combination of acetous acid with ammoniac. See AMMONIA ACETATA.

AQUA AMMONIÆ PURÆ; the former *spiritus salis ammoniaci cum calce.* It is water saturated with ammoniacal gas. See AMMONIAC.

AQUA ANETHI; the distilled water of aniseed. See ANETHUM.

AQUA CALCIS; lime-water. It is given internally in cardialgia, spasms, diarrhœa, and convulsions of children, arising from acidity or ulcerated intestines, intermitting fevers, &c. Externally, it is applied to burns and ulcers, mixed with oil. See CALX, and the article BURNS.

AQUA CELESTIS. See CUPRUM.

AQUA CINNAMOMI, formerly named *aqua cinnamomi simplex;* distilled cinnamon water. For its virtues, see CINNAMOMUM.

AQUA CUPRI AMMONIATI, or AQUA SAPPHIRINA. This preparation is employed by surgeons as a collyrium, and to stimulate foul ulcers. See CUPRUM.

AQUA CUPRI VITRIOLATI COMPOSITA; a preparation of the Edinburgh Pharmacopœia, used externally to stop hæmorrhages of the nose, &c. See CUPRUM.

AQUA FŒNICULI; distilled fennel-water. See FŒNICULUM.

AQUA FORTIS. See ACIDUM NITROSUM DILUTUM.

AQUA KALI; formerly *oleum tartari per deliquium*, or *lixivium tartari;* liquid carbonate of potass, *carbonas potasse liquidas.* It possesses antacid virtues, and is a good antidote against metallic salts taken into the stomach as poison. It is also given with advantage in convulsions and spasms, from acidity in the stomachs of children, in calculous diseases, gouty affections, scrophula, aphthæ, &c. The carbonate of soda is milder, and perhaps a preferable remedy for general use. See POISONS, KALI and CARBONAS SODÆ.

AQUA KALI PURI, formerly called *lixivium saponarium.* This remedy possesses diuretic and lithontriptic virtues, if given enveloped in weak broths or mucilaginous drinks. Diluted in tepid water, in the proportion of three drops to two ounces, it serves as an efficacious detergent in xerophthalmia. See KALI.

AQUA LITHARGYRI ACETATI, *acetum lithargyri*, or *extractum saturni.* This is the celebrated extract of Goulard; called acetis plumbi liquidus, in the new chemical nomenclature. It has, till of late years, been much employed by surgeons in the aqua lithargyri acetati composita. Externally applied, as a resolvent in inflammatory affections, it has some good qualities; but its absorption from the skin, notwithstanding Mr. B. Bell's assertion to the contrary, has proved in many instances fatal to health. On this account, it is almost universally laid aside by the London practitioners, who now prefer muriated ammonia, alum, or some of the metallic salts, with more security, and equal advantage. See PLUMBUM.

AQUA LITHA'RGYRI ACETATI COMPOSITA; *aqua vegeto-mineralis; Goulard's vegeto-mineral water.* The properties of this water as a topical remedy, are sedative. See PLUMBUM.

AQUA MENTHÆ PIPERITIDIS. See MENTHA PIPERITIS.

AQUA MENTHÆ SATIVÆ, in former dispensatories, *aqua menthæ vulgaris simplex.* See MENTHA SATIVA.

AQUA PIMENTO; formerly *aqua piperitidis Jamaicensis.* For the virtues of this distilled water, see PIMENTO.

AQUA PULEGII, or *aqua pulegii simplex.* See PULEGIUM.

AQUA ROSÆ; distilled rose-water. It is employed only as a pleasant vehicle for other medicines, and in collyria, &c. See ROSA.

AQUA ZINCI VITRIOLATI. See ZINCUM.

AQUA ZINCI VITRIOLATI CUM CAMPHORA; otherwise named *aqua vitriolica camphorata.* This, when properly diluted, is an useful collyrium for inflammations of the eye, in which there is a great weakness of the sight. Externally, it is applied to scorbutic and phagedenic ulcerations. See ZINCUM.

AQUÆ DISTILLATÆ; distilled waters. These are made by introducing vegetables, as mint, penny-royal, &c. into a still with water; and drawing off as much as is found to possess the properties of the plants. Simple water is also distilled to separate its impurities and the earthy salts which are held in solution. This last is used in all nice chemical experiments.

AQUÆ MINERALES. See MINERAL WATERS.

AQUÆDUCTUS FALLOPII; a canal in the petrous portion of the temporal bone, first accurately described by Fallopius. See EUSTACHIAN TUBE.

AQUÆ TAURI, hot waters or baths in Tuscany, at the distance of three miles from the sea, said to be discovered by a bull; whence the appellation. There are still to be seen the ruins of these baths. The people are called Aquenses Taurini by

Pliny. It is the place now named Acquapendente, in Orvieto.

AQUATICA NUX. See Tribulus aquaticus.

AQUATICÆ, (from *aqua*, water); a term, in botany, applied to plants that grow in, or near to the water. These are called *aquatics*, and give name to a class in Dodoneus's, Porta's, and J. Bauhine's Methods. When artificial arrangement was yet in its infancy, systems were constructed, not as in modern times, from the structure and situation of a particular part, but from a complex view of the whole plant. Neither was this view confined merely to the habit; it included every circumstance, however different; the place of growth, the time of flowering, the medicinal and œconomical uses, the sensible qualities, and several other particulars, which by modern botanists, the only genuine systematical writers, are necessarily disregarded as primary characters, but deserve every consideration as secondary marks of distinction, and as being useful for obtaining a complete knowledge of the vegetable world.

AQUEOUS HUMOUR; one of the humours of the eye. It is a limpid water that fills all the space between the transparent cornea and the anterior part of the crystalline lens. The space in which this fluid is confined, is called the anterior chamber. The vessels which furnish it are too small to be demonstrated. If a wound is made in the cornea, that discharges this fluid, it is restored in two or three days again. In old age it is not so limpid, whence probably one cause of obscure sight at that period of life. The uses of it seem to be, first, to keep the cornea distended, so that the rays of light may be duly refracted in passing to the retina; and, secondly, for the iris to float loosely in, and thereby perform its actions more easily. See Eye.

A'QUIFOLIUM, (from *acus*, a needle, and *folium*, a leaf; so called on account of its prickly leaf); the *ilex aquifolium; foliis ovatis acutis spinosis*, Linn. The leaves of this plant have been known to cure intermittent fevers; and an infusion of the leaves, drank as tea, is said to be a preventive against the gout.

A'QUILA ALBA; one of the names given to calomel by the ancients. See Calomelas.

A'QUILEGIA, (from *aqua*, water, and *lego*, to gather); so called from the shape of its leaves, which retain water; the herb Columbine. The seeds, flowers, and the whole plant, *aquilegia vulgaris; nectariis incurvis* Linn. have been used medicinally, the first in exanthematous diseases, the latter chiefly as an antiscorbutic remedy. Though retained in several foreign pharmacopœias, their utility seems to be disallowed in this country.

Of this plant the species are: 1. The *vulgaris*, or wild columbine, with blue flowers, is found growing wild in some woods of England. 2. The *alpina*, with long oval flowers, grows naturally near Ingleborough-hill in Yorkshire. The flowers are much larger than those of the garden columbine. 3. The *inversa*, or garden columbine. Of this there are great varieties, not only in the colour and fullness of their flowers, but also in their form. 4. The *canadensis*, or Canada columbine, flowers almost a month before the other sorts, and therefore is preserved in gardens, though not at all remarkable for its beauty. There is a variety of this with taller flower-stems.

A'QUULA, (dim. of *aqua*, water); a small quantity of very pure limpid water. This term is applied to the pellucid water, which distends the capsule of the crystalline lens of the eye, and also the lens itself.

A'QUULA, a tumor of the eye-lid; thus named by P. Egineta. He says, it is a pinguious substance under the skin of the eye-lid. To cure it, an incision is to be made through the skin, and the cyst is to be dissected out.

ARABIC GUM, *(gummi arabicum)*; so called from its being brought from Arabia. This gum exudes, in a liquid state, from the bark of the trunk of the *mimosa nilotica* Linn. *Mimosa, spinis stipularibus patentibus, foliis bipinnatis: partialibus extimis glandula intertinctis, spicis globosis pedunculatis.* It issues in a similar manner to the gum which is found upon the cherry-trees in this country. That which is of a pale yellowish or amber colour is most esteemed. Gum arabic is neither soluble in spirit nor in oil; but in twice its quantity of water, it dissolves into a mucilaginous fluid, of the consistence of a thick syrup, and in this state answers many useful pharmaceutical purposes, by rendering oily and resinous substances miscible with water. The glutinous quality of gum arabic renders it preferable to other gums and mucilages as a demulcent in coughs, dryness of the throat, hoarsenesses, and other catarrhal affections. It is also very generally employed in ardor urinæ, diarrhœa, and calculous complaints, as it passes unaltered into the secretions, and prevents irritation arising from acrimony. See Mimosa nilotica.

A'RACA MI'RI, (Indian); a shrub growing in Brasil. It bears fruit in March and September, which tastes like a mixture of musk and strawberries; and when candied, or made into a marmalade, is cooling and moderately astringent. The leaves and buds have the same qualities, and the root is diuretic and antidysenteric.

ARACHNOI'DES TUNICA, (*αραχνοειδης*, from *αραχνη*, a *spider*, and *ειδος*, *form)*; the external lamina of the pia mater; thus named, from its resemblance to a cobweb. Also a name of the capsula of the crystalline humour of the eye. Celsus says, that Herophilus named the coat thus which immediately invests the vitreous humour.

ARACK, arrack, or rack, a spirituous liquor

imported from the East Indies, used by way of dram and in punch. The word ARACK is an Indian name for strong waters of all kinds; for they call our spirits and brandy, English arack. But what we understand by the name arack, is really no other than a spirit procured by distillation from a vegetable juice called TODDY, which flows by incision out of the cocoa-nut tree, like the birch juice procured among us. The toddy is a pleasant drink by itself, when new, and purges those who are not used to it; and, when stale, it is heady, and makes good vinegar. The English at Madras use it as leaven to raise their bread with.

Goa or Batavia are the chief places for arack. At Goa there are different kinds; single, double, and treble distilled. The double distilled, which is that commonly sent abroad, is but a weak spirit in comparison to Batavia arack: yet, on account of its peculiar and agreeable flavour, it is preferred to all other aracks of India. This is attributed to the earthen vessels, which alone they use at Goa to draw the spirit; whereas at Batavia they use copper stills. The Parier arack made at Madras, and the Columbo and Quilone arack at other places, being fiery hot spirits, are but little valued by the Europeans, and therefore seldom imported, though highly prized among the natives.

With regard to its effects on the stomach, Dr. Cullen puts arack on a footing with other spirituous liquors.

ARÆOMETER, an instrument to measure the gravity of liquors; which is usually made of a thin glass ball, with a taper neck, sealed at the top, there being first as much mercury put into it as will keep it swimming in an exact posture. The neck is divided into two parts, which are numbered, that so, by the depths of its descent into any liquor, its lightness may be known by these divisions.

ARA'LIA, *berry-bearing angelica*; a genus of the pentagynia order, belonging to the pentandria class of plants. Of the species, some authors enumerate five; but none of them merit particular description, except one called *nudicaulis*, having a naked stalk. This grows three or four feet high; the leaves have two large trifoliate lobes, which are sawed on their edges. The flower-stalks arise between these, immediately from the root, and are terminated by round umbels of small four-leaved flowers of a whitish colour. What is remarkable of this species is, that its roots were brought over from North America, where it grows, and sold here for SARSAPARILLA; and it is still used as such by the inhabitants of Canada, though it is very different from the true sort. All the species of this plant are hardy, except one called the spinosa, which requires an hot-bed; but it is seldom cultivated except in botanic gardens.

ARA'NEA, the spider, a genus of insects belonging to the order of aptera, or insects without wings. All the species of spiders have eight legs, with three joints in each, and terminating in three crooked claws; eight eyes, two before, two behind, and the rest on the sides of the head. The mouth consists of two claws or talons, denticulated like a saw. A little below the point of the claw, there is a small hole, through which the spider emits a kind of poison. These claws are the weapons with which they kill flies, &c. for their food. The belly, or hinder part, is separated from the head and breast by a small thread-like tube. The skin or outer surface is a hard polished crust. Spiders have five tubercles or nipples at the extremity of the belly, whose apertures they can enlarge or contract at pleasure. It is through these apertures that they spin a gluey substance with which their bellies are full. They fix the end of their threads by applying these nipples to any substance, and the thread lengthens in proportion as the animal recedes from it. They can stop the issuing of the threads by contracting the nipples, and reascend by means of the claws on their feet, much in the same manner as some men warp up a rope.

Linnæus enumerates forty-seven species of spiders; and the bites of some of them are accounted venomous. Few however, even of the largest kind, and in hot climates, can do much harm; the sting they inflict being easily remedied by oily frictions, vinegar, or ardent spirits in which camphor has been dissolved. Of one species, however, the ARANEA TARANTULA, such extraordinary things have been related, that we must necessarily speak of it somewhat in detail.

The breast, belly, and legs, of this creature are of an ash colour; the latter with blackish rings on the under part. Its fangs, or nippers, are red on the inner side, the rest being blackish. It has antennæ, or feelers. Two of its eyes are larger than the rest, red, and placed in the front; four other eyes are placed in a transverse direction towards the mouth; the other two are nearer the back. It is a native of Italy, Cyprus, Barbary, and the East Indies. The breast and belly are about two inches long, terminated by two short tails.

The bite of the tarantula is said to occasion an inflammation in the part, which in a few hours brings on sickness, difficulty of breathing, and universal faintness. The person afterwards is affected with a delirium, and sometimes is seized with a deep melancholy. The same symptoms return annually, in some cases, for several years; and at last terminate in death. Music, it has been pretended, is the only cure. A musician is brought, who tries a variety of airs, till at last he hits upon one that urges him to dance; the violence of which exercise produces a proportionable agitation of the vital spirits, attended with a consequent degree of perspiration, the certain consequence of which is a

cure. Such are the circumstances that have been generally related, and long credited, concerning the bite of this animal. Kircher, in his *Musurgia*, gives a very particular account of the symptoms and cure, illustrated by histories of cases. Among these, he mentions a girl, who, being bitten by this insect, could be cured only by the music of a drum. He then proceeds to relate that a certain Spaniard, trusting to the efficacy of music in the cure of the frenzy occasioned by the bite of the tarantula, submitted to be bitten on the hand by two of these creatures, of different colours, and possessed of different qualities. The venom was no sooner diffused about his body, than the symptoms of the disorder began to appear; upon which harpers, pipers, and other musicians, were sent for, who, by various kinds of music, endeavoured to rouse him from that stupor into which he was fallen: but here it was observed that the bites of the two insects had produced contrary effects; for by one he was incited to dance, and by the other he was restrained from it; and in this conflict of nature the patient expired. The same account is given in his *Phonurgia Nova*, with the addition of a cut representing the insect in two positions, the patient in the action of dancing, together with the musical notes of the tune, or air, by which, in one instance, the cure was effected.

In his *Musurgia*, this author, attempting mechanically to account for the cure of the bite of the tarantula by music, says of the poison, that "it is sharp, gnawing, and bilious; and that it is received and incorporated into the medullary substance of the fibres." With respect to the music, he says, that the sounds of chords have a power to rarify the air to a certain harmonical pitch; and that the air, thus rarified, penetrating the pores of the patient's body, affects the muscles, arteries, and minute fibres, and incites him to dance, which exercise begets a perspiration, in which the poison evaporates.

Unsatisfactory as its theory appears, the belief of this strange phenomenon prevailed among some of the ablest physicians. Sir Thomas Brown, so far from disputing it, says, that "since many attest the fact from experience, and that the learned Kircherus hath positively averred it, and set down the songs and tunes solemnly used for the cure of the disease, and since some also affirm that the tarantula itself will dance at the sound of music, he shall not at all question it."

Farther, that eminent Italian physician and anatomist of the last century, Baglivi, a native of Apulia, the country where the tarantula is produced, has written a dissertation *De Anatomia, Morsu, et Effectibus Tarantulæ*. In this he describes the region of Apulia, where the tarantula is produced, with the anatomy and figure of the insect and its eggs, illustrated by an engraving. He mentions particularly the symptoms which follow from the bite, and the cure of the disease by music, with a variety of histories of cures thus wrought, many of them communicated by persons who were eye-witnesses of the process.

Ludovicus Valetta, a Celestine monk of Apulia, published at Naples, in the year 1706, a treatise upon this spider, in which he not only answers the objections of those who deny the whole thing, but gives, from his own knowledge, several instances of persons who had suffered this way, some of whom were of great families, and so far from being dissemblers, that they would at any rate, to avoid shame, have concealed the misfortune which had befallen them.

The honourable Mr. Robert Boyle, in his treatise "Of Languid and Unheeded Motions," speaking of the bite of the tarantula, and the cure of the disease which follows it, by means of music, says, that, having himself had some doubts about the matter, he was, after strict inquiry, convinced that the relations in the main were true.

Lastly, Dr. Mead, in his Mechanical Account of Poisons, has given an essay on the tarantula, containing the substance of the above relations, which he endeavours to confirm by his own reasoning.

Notwithstanding the number and weight of these authorities, and the general acquiescence of learned and ingenious men in the opinion that the bite of the tarantula is poisonous, and that the cure of the disorder occasioned by it is effected by music, we have reason to apprehend that the whole is a mistake.

In the Philosophical Transactions for the year 1672, p. 406. is an extract of a letter from Dr. Thomas Cornelio, a Neapolitan physician, to John Doddington, Esq. his majesty's resident at Venice, communicated by the latter, in which, speaking of his intention to send to Mr. Doddington some tarantulas, he says, "Mean while, I shall not omit to impart to you, what was related to me a few days since by a judicious and unprejudiced person; which is, that being in the country of Otranto, where those insects are in great numbers, there was a man who, thinking himself stung by a tarantula, shewed in his neck a small speck, about which in a very short time there arose some pimples full of a serous humour; and that, in a few hours after, the poor man was sorely afflicted with very violent symptoms, as syncopes, very great agitations, giddiness of the head, and vomiting; but that, without any inclination at all to dance, and without all desire of having any musical instruments, he miserably died within two days. The same person affirmed to me, that all those that think themselves bitten by tarantulas, except such as for evil ends feign themselves to be so, are for the most part young wanton girls, whom the Ita-

lians call *dolce di sale;* who, by some particular indisposition falling into this melancholy madness, persuade themselves, according to the vulgar prejudice, they have been stung by a tarantula."

Dr. Serao, an Italian physician, as it seems, has written an ingenious book, in which he has effectually exploded this opinion as a popular error; and in the Philosophical Transactions, No. LX. for the year 1770, p. 236. is a letter from Dominico Cirillo, M.D. professor of natural history in the university of Naples, wherein, taking notice of Serao's book, he says, That, having had an opportunity of examining the effects of this animal in the province of Taranto, where it is found in great abundance, he finds that the surprising cure of the bite of the tarantula by music has not the least truth in it; and that it is only an invention of the people, who want to get a little money by dancing when they say the tarantism begins. He adds: "I make no doubt but sometimes the heat of the climate contributes very much to warm their imaginations, and throw them into a dilirium, which may be in some measure cured by music: but several experiments have been tried with the tarantula, and neither men nor animals, after the bite, had any other complaint than a very trifling inflammation upon the part, like that produced by the bite of a scorpion, which goes off by itself without any danger at all. In Sicily, where the summer is still warmer than in any part of the kingdom of Naples, the tarantula is never dangerous; and music is never employed for the cure of the pretended tarantism."

ARA'NEA. By this name some writers have also called the capsula of the crystalline humour of the eye, which is furnished with vessels from the ciliary processes, and from an artery which enters the bottom of the retina, and runs through the vitreous humour. The name of aranea is also given to the coat of the *vitreous* humour, from its resembling a spider's web; called also arachnoides, which name was given to it by Herophilus. Dr. Nicholls and Albinus, who injected it, say, that the vessels run upon it like rays from a centre.

A'RBOR, a tree; a perennial plant which rises to a very great height, with a simple, woody, and durable stem, or trunk. By these characters it is that trees are distinguished from herbs, whose stems are frequently compounds, herbaceous, or succulent, and die down to the root every year. All trees too are perennial, as is evident from the characters enumerated above: many herbs are either annual, that is, of one year's duration; or biennial, of two; those only are perennial, whose roots, not perishing with the stems, continue a long time under the surface of the ground, and put forth a new stem every year.

Upon these obvious differences was founded the very ancient division of vegetables, into herbs and trees; though, perhaps, that distinction was principally suggested by the difference of size and duration of the plants in question. Be that as it may, the division was esteemed so natural and spontaneous, that, from the time of Aristotle and Theophrastus to the present age, it has obtained a principal place in almost every system, those of Rivinus and Linnæus excepted, which put herbs and trees promiscuously together.

Among the celebrated botanists who have adhered to the ancient distinction, are Cæsalpinus, the father of systematic botany; Morison, Hermannus, Christopher, Knaut, Boerhaave, Ray, Pontedera, and Tournefort. Dr. Milne, in his Botanical Dictionary, says of the latter, that rather than omit a division, through custom become necessary, he chose to hurt the elegance and uniformity of his plan; and, in fact, spun out into twenty-two classes, what, without such a division, might have been easily comprised in seventeen.

In opposition to these are ranged, besides Rivinus and Linnæus, already mentioned, Christian Knaut, Ludwig, and other persons of less reputation in botany.

The distinction into trees and shrubs, though of equal antiquity, is neither so obvious, nor are its limits so accurately ascertained. In fact, of the numerous characteristic differences which have been suggested by botanical writers, not one is perfectly satisfactory. To say, with Tournefort, that trees are universally taller than shrubs, is, in effect, saying nothing, unless an immutable standard were previously established. Besides, every thing respecting dimension is so variable in its nature, and depends so much upon difference of climate, soil, and management, that, were a standard of this kind attempted to be established, the greatest confusion would ensue; and the same plant in different countries, and even in opposite soils in the same country, would receive different appellations, according as it exceeded, or came short of the given standard.

As instances of this, Dr. Milne adduces the *ricinus*, or palma-christi; the dwarf rosebay, *rhododendron;* the strawberry-tree, *arbutus;* and several others, which grow to the size of very large trees in warm climates, but, in this country, are equalled, and even exceeded, in height, by many of our smallest shrubs.

The difference of soil and culture in the same climate, produces a like diversity in size. Thus, to take an example from herbaceous vegetables, the marigold, which, in a fat and moist earth, rises two feet high, scarce exceeds the same number of inches in a dry and gravelly soil.

"Nature," says Linnæus, "has put no limits between trees and shrubs." Where then are we, to search for the foundation of this distinction? Not in the difference of size and height, for nothing

can be more fallible. "Either," he continues, "there are no limits at all, or they are to be found in the buds; and the plants are stiled trees when their stems come up with buds; shrubs when they arise without buds:" but this distinction is sufficiently confuted by its author, who immediately subjoins, that there are seldom any buds upon the very large trees in India; which must, therefore, notwithstanding their great height, according to this definition, be reckoned shrubs.

The late Dr. Alston, in his "*Tyrocinium Botanicum*," seems to consider the distinction into trees and shrubs as a true natural distinction, and endeavours to trace its foundation in the internal structure of the plants themselves. "All trees," says he, "whether they bear buds or not, are covered with the two barks, the outer and the inner, called by botanists *cortex* and *liber*. Shrubs differ from herbaceous vegetables in the duration of their stems; from trees in the nature of their covering, which is not a bark, but a cuticle, or simple skin." The fact, however, is not sufficiently established.

The farther distinction into shrubs and undershrubs, which is exceedingly arbitrary and indeterminate, was first suggested by Clusius, in a work entitled, "*Rariores & Exoticæ Plantæ*," published in 1576; and afterwards adopted by Cæsalpinus and other botanical philosophers.

ARBOR VITÆ. On each side of the fourth ventricle of the brain, the medullary substance of the cerebellum forms a trunk which expands itself in form of laminæ through the cortical strata. These ramifications are thus named.

ARBOR VITÆ; *thuya occidentalis; strobilis lævibus, squamis obtusis*, Linn. The leaves and wood were formerly in high estimation as resolvents, sudorifics, and expectorants, and were given in phthisical affections, intermittent fevers, and dropsies, but modern practice rejects them.

ARBORE'SCENS, (from *arbor*, a tree); arborescent. A plant that is more than a shrub, but less than a tree, is thus denoted. See DENDROIDES.

ARBUSTI'VA, (from *arbustum*, a *copse of shrubs* or trees; an orchard or vineyard); the thirty-ninth order of plants in the former editions of Linnæus's Fragmenta, containing these genera, the myrtle, mock-orange, *philadelphus; eugenia*, guayava, or bay-plumb, *psidium;* and the clove-tree, *caryophyllus.* The first four belong to the class *Icosandria* in the sexual system; the last to the class *Polyandria.* In the latest editions of the fragments of a natural method, the abovementioned genera form the nineteenth order, under the title of *Hesperideæ.*

ARBU'TUS PAPYRA'CEA, (so called *quia crescit inter arbusta*, because it grows in shrubby places); called also *unedo papyracea, fragaroides, fragaria*, &c. the strawberry-tree.

In common with the summer-fruits in general, the fruit of this tree, called *mæmacylon*, is reckoned cooling and relaxing, antiseptic, aperient, and as promoting the urinary and alvine secretions: mixed with watery liquors, their juice is said to be of use in fevers. The jellies, and inspissated juices, are less flatulent than the raw fruit. See FRAGA.

The strawberry-tree is somewhat like a quince-tree, and is common in the south of Europe. The fruit is that which properly is called UNEDO and COMARUS.

ARBUTUS UVA URSI; the systematic name for the officinal woolly-headed burdock. See the article UVA URSI.

A'RCA ARCANO'RUM; the philosophorum mercurius, or *mercury of metals* of the alchemical philosophers. It is described to be a pure fluid substance in form of running mercury, found in all mercury, and capable of being extracted from it. The notion of the *mercury of metals* was founded on the common system of the chemists of former times, namely, that quicksilver was the *basis of all metals*, and that these last are nothing but mercury fixed by a certain sulphur.

ARCA'NUM, (from *arca*, a chest); a secret nostrum, or medicine, whose preparation or efficacy is kept from the world, in order to enhance its value. The old chemists describe it as "a thing secret and incorporeal; which can only be known *by experience;* for it is the virtue of every thing, which operates a thousand times more than the thing itself." See NOSTRUM.

The arcanum Theophrasti, is described by that writer as "the quintessence of any thing most high and exalted;" or, as he says, "it is the virtue of a thing refined by a thousand exaltations." He boasts of four arcana, especially, 1. The arcanum of the first matter. 2. Of the philosopher's stone. 3. Of the mercury of life. 4. Of tincture. Whilst these pretensions now only excite ridicule, let it not be forgotten, that the public are no less the dupes of arcana at present, than in the days of alchemy; witness *botanical* syrup and *balm* of Gilead.

ARCHÆUS, (from ἀρχαιος, signifying *ancient)*, as applied in medicine, denotes the ancient practice, concerning which, in his time, Hippocrates wrote a whole treatise. Sometimes it was used to denote that natural state which preceded a disease. This, by some, likewise is used synonimously with *archeus*, a term employed by van Helmont to express an internal efficient cause of all things. This seems no other than the *anima mundi* of his predecessors; and, as he applies it to particular animated beings, it differs not from the δυναμις, or *vis plastica* of the old philosophers.

A'RCHE, (αρχη); the first attack of a disease; its first stage, or that period of a disorder in which the patient first takes to his bed, or in which help might be effectual.

A'RCHIL, ARCHILLA; also called ROCELLA, and

ORSIELLE; a whitish moss which grows upon rocks, in the Canary and Cape Verd islands, and yields a rich purple tincture, fugitive indeed, but extremely beautiful. This weed is imported to us as it is gathered. Those who prepare it for the use of the dyer, grind it betwixt stones, so as to thoroughly bruise, but not to reduce it into powder; and then moisten it occasionally with a strong spirit of urine, or urine itself mixed with quicklime; in a few days it acquires a purplish red, and at length a blue colour. In the first state it is called archil; in the latter, litmus.

The dyers rarely employ this drug by itself, on account of its dearness and the perishableness of its beauty. The chief use they make of it is, for giving a bloom to other colours, as pinks, &c. This is effected by passing the dyed cloth or silk through hot water lightly impregnated with the archil. The bloom thus communicated soon decays upon exposure to the air. Mr. Hellot informs us, that, by the addition of a little solution of tin, this drug gives a durable dye; that its colour is at the same time changed towards a scarlet; and that it is the more permanent, in proportion as it recedes the more from its natural colour.

Prepared archil very readily gives out its colour to water, to volatile spirits, and to spirit of wine; it is the substance principally made use of for colouring the spirit in thermometers. As exposure to the air destroys its colour upon cloth, the exclusion of the air produces a like effect in these hermetically sealed tubes, the spirit in large thermometers becoming in the compass of a few years colourless. M. l'abbé Nollet observes (in the French Memoirs for the year 1742), that the colourless spirit, upon breaking the tube, soon resumes its colour, and this for a number of times successively; that a watery tincture of archil, included in the tubes of thermometers, lost its colour in three days; and that, in an open deep vessel, it became colourless at the bottom, while the upper part retained its colour.

A solution of archil in water, applied on cold marble, stains it of a beautiful violet, or purplish blue colour, far more durable than the colour which it communicates to other bodies. Mr. du Fay says, he has seen pieces of marble stained with it, which in two years had suffered no sensible change. It sinks deep into the marble, sometimes above an inch; and at the same time spreads upon the surface, unless the edges be bounded by wax or other like substances. It furnishes a useful test in chemical examination, but its medical properties are unknown.

Linnæus informs us, in the Swedish Transactions for the year 1742, that the true archil moss is to be found on the western coasts of England.

ARCHOPTO'MA, (from αρχος, *anus*, and πιπτω, *to fall down)*; in Vogel's Nosology, is defined a prolapsus, or bearing down, of the rectum.

ARCTA'TIO, vel ARCTITUDO, (from *arcto*, to make narrow); a term used, by the old writers, to denote that state when the intestines are constipated from an inflammation. It also was used in describing a preternatural straitness or stricture of the pudendum muliebre.

A'RCTIUM, (from αρκτιον; from α ρκτος, a *bear;* so called from its roughness); BURDOCK.

It is a genus of the polygamia æqualis order, belonging to the syngenesia class of plants. Of this genus there are three species; the *lappa*, or common burdock, the *tomentosum*, and the *personata*. All these are common in Britain, and reckoned very troublesome weeds; the roots, however, last but two years. The tender stems of the common kind, deprived of the bark, may be boiled and eaten like asparagus. When raw, they are also good, with oil and vinegar, as a sallad. Boys catch bats by throwing the prickly heads of this species into the air. The ARCTIUM LAPPA is used medicinally. The seeds have a bitterish subacrid taste: they are recommended as very efficacious diuretics, given either in the form of infusion, or in powder to the quantity of a drachm. The roots taste sweetish, with a slight austerity and bitterishness; they are esteemed aperient, diuretic, and sudorific; and act without irritation, so as to be safely ventured upon in acute disorders. See BARDANA.

ARCTIUM LAPPA, (called lappa, απο το λαβειν, from its seizing the garments of passengers); the systematic name for the bardana. See BARDANA.

ARCTU'RA, (from *arcto*, to straiten); an inflammation, &c. of the finger, or of the toe, arising from a curvature of the nail inwards. Linnæus makes use of this term.

ARDENT FEVER, FEBRIS ARDENS, called by the ancients *deurens febris*, *cholerica febris*, &c.; a tertian remittent; the causus of the Greek physicians. See CAUSUS.

ARDENT SPIRITS; alkohol, diluted with a proportion of water, as in brandy, rum, gin, whiskey, &c. or any vinous spirit produced from the fermentation of saccharine substances, has this appellation.

A'RDOR URINÆ, a scalding of the urine. See DYSURIA.

A'REA, signifies the internal capacity of any given boundary or limit, of what figure or shape soever. It is a term also used by miners for a certain compass of ore allotted for diggers: and some physical writers use it for a species of the alopecia. See ALOPECIA.

ARE'CA, (from αρηγω, to *assist*, because it is taken to help digestion); a genus of the order of *palmæ pennatifoliæ*. The male has no calix, but three petals, and nine stamina; the female has no calix; the corolla has three petals, and the calix is imbricated. There is only one species, viz. the

catecu, a native of India. This has no branches, but its leaves are very beautiful: they form a round tuft at the top of the trunk, which is as straight as an arrow. It grows to the height of 25 or 35 feet, and is a great ornament in gardens. The shell, which contains the fruit, is smooth without, but rough and hairy within, in which it pretty much resembles the shell of the cocoa-nut. Its size is equal to that of a pretty large walnut. Its kernel is as big as a nutmeg, to which it bears a great resemblance without, and has also the same whitish veins within when cut in two. In the centre of the fruit, when it is soft, is contained a greyish and almost liquid substance, which grows hard in proportion as it ripens. The fruit when ripe is astringent, but not unpalatable, and the shell is yellowish. Of this fruit there is a prodigious consumption in the East Indies, there being scarce any person, from the richest to the poorest, who does not make use of it; and the trade they have in it is incredible. The chief use that is made of areca is to chew it with the leaves of betel, mixing with it lime made of sea-shells. In order to chew it, they cut the areca into four quarters, and take one quarter of it, which they wrap up in a leaf of betel, over which they lay a little of the lime; afterwards they tie it, by twisting it round. This bit, prepared for mastication, is called *pinang;* which is a Malayan word, used all over the East Indies. The pinang provokes spitting very much, whether it be made with dried or fresh areca; the spittle is red, which colour the areca gives it. This mastication cools the mouth, and fastens the teeth and gums. When they have done chewing the pinang, they spit out the gross substance that remains in the mouth. They are under a mistake who imagine that fresh areca melts entirely in the mouth. Nor is it a less mistake to think, that the teeth, which are tinged red during the time of chewing, always retain that colour. As soon as they have done chewing the pinang, they wash their mouth with fresh water, and then their teeth are white again. The Europeans who live at Batavia, or Malaca, and in the Sunda and Molucca islands, use pinang as much as the Indians do; and by washing their teeth they preserve them white. Some allege that areca strengthens the stomach, when the juice of it is swallowed, as by most of the Indians. Another property ascribed to it is, its curing or carrying off all that might be unwholesome or diseased in the gums. When eaten by itself, as is sometimes done by the Indians, it impoverishes the blood, and causes the jaundice; but is not attended with these inconveniences when mixed in the usual way with betel.

The Siamese call it *plou* in their language. The best areca of the Indies comes from the island of Ceylon. The Dutch East-India company send a great deal of it in their ships into the kingdom of Bengal. There grows in Malabar a sort of red areca, which is very proper for dying in that colour. The same company send some of it from time to time to Surat and Amadabat, for the use of the dyers in the dominions of the great mogul.

ARE'OLA, (a dim. of *area*, a void space); a small brown circle, which surrounds the nipples of females. During and after pregnancy, it spreads and becomes considerably larger.

ARETÆUS of Capadocia, a greek physician of the sect of the Pneumatists, lived in the reign of Augustus, according to some; according to others, under Trajan or Adrian. He wrote several treatises in the Ionian dialect, on acute diseases, and other medicinal subjects; some of which are still extant. The best edition of his works is that of Boerhaave, in Greek and Latin, with notes, printed in 1731; that of Wigan, printed at Oxford, in 1723, in folio, is also much esteemed.

ARETÆNOIDES, (from αρυω, *to draw*, ανοιγω, *to open*, and ειδος, *form)*, a cartilage, and also a muscle of the trachea. See Arytænoideus.

ARGE'NTUM, (from αργεννον, white) *silver;* a metal of a white colour, possessing neither smell nor taste, nearly unalterable by fire, very ductile and tenacious. According to the experiments of Brisson, a cubic foot of this metal, when cast, weighs seven hundred and twelve pounds; and its specific gravity is also pretty considerable. This metal is found in the earth in different stratas.

Silver may be rendered hard by mixing it with copper; and for this reason it is alloyed with that metal for silversmiths work, and other purposes.— This metal slightly changed by the contact of the air. A considerable heat is required to fuse it; but it may be volatilized by a strong fire without alteration, as has been proved by the experiments of the academicians of Paris, made in the focus of the lens of Mr. Trudaine. It emits a thick fume, which whitens plates of gold exposed immediately over it. Junker has also converted silver into glass, by treating it in the way of reverberation in a very strong fire; and Macquer, by exposing silver twenty times successively to the porcelain furnace of Seves, obtained a glass of an olive-green colour. It was also observed that this metal, when exposed to the focus of a burning glass, presented a white pulverulent matter on its surface, and a greenish vitreous covering on the support upon which it was placed. But though these experiments clearly prove that silver is capable of combining with oxigene, the difficulty which is found in effecting this combination, and the facility with which this air is disengaged from the oxides of silver, prove that there is but little affinity between these two substances. If silver in a state of extreme division be presented to the concentrated and boiling sulphuric acid, Mr. De Fourcroy has observed that sulphureous gas is disengaged; and that the silver is reduced into a

white matter, which is a true oxide of silver, containing a small quantity of sulphate, which may be obtained in small needles, or in plates formed by the union of these needles in a longitudinal manner. This salt flows by heat, and is very fixed. If this metal be precipitated by other metals or alkalis, these precipitates are reducible without addition.

Silver is dissolved by the nitric acid with rapidity; and much nitrous gas is disengaged. The solution is at first blue; but this colour disappears when the silver is pure, and degenerates into a green colour, if it be alloyed with copper. The nitric acid is capable of dissolving more than half its weight of this metal; the solution then lets fall crystals in hexagonal, triangular, or square plates, which are called *Nitrate of Silver*, *Lunar Nitre*, &c. The solution of these crystals generally known by the name of *Solution of Silver*, is very caustic. It colours the skin black, burns the epidermis, and so completely destroys its organization, that the spot disappears only by the renewing of the skin. The nitrate of silver melts on burning coals; but if it be exposed to a gentle heat, in earthen or metallic vessels, it liquefies, and may then be cast in moulds. This fused nitrate of silver forms the *nitras argenti fusus*, *argentum nitratum*, or *Lunar Caustic* of the Dispensatories.— See Argentum Nitratum. When made with pure silver, and properly prepared, this substance is whitish; but when suffered to remain in fusion for any time, it is blackish. It is very frequently mixed with nitrate of copper; a fraud which is highly reprehensible, although it does not render its use to wounds very precarious.

This metal may be precipitated from its solutions, by lime-water, alkalis, and several metals; and these last exhibit very curious and important phenomena. If a plate of copper be immersed in a solution of silver diluted with water, it precipitates the metal; and this adheres, at the moment of precipitation, to the surface of the copper, where it forms a kind of moss. In proportion as the silver is precipitated, the water assumes a blue tinge; which proves that the copper is dissolved in the nitric acid, in the room of the silver. When the whole of the silver is disengaged, the water is to be decanted, the silver dried, and fused in crucibles, to be cast into ingots. This silver almost always retains a small quantity of copper, of which it may, however, be deprived by cupellation with lead, which renders the silver pure: this process is used in the mints, where the parting operation of gold from silver is performed. The first step consists in separating the silver by means of nitric acid; and this is afterwards precipitated by the addition of copper. Silver is likewise precipitated by mercury. In this operation it amalgamates with a small quantity of the mercury, and forms tetrahedral crystals terminated by a tetrahedral pyramid, the crystals of which are articulated into each other. This arrangement gives them the form of a vegetation; and has caused the precipitate to be known by the name of *Arbor Dianæ*, or the *Tree of Diana.* Lemery, Homberg, and many other chemists, have successively published processes to produce this phenomenon; but that which Mr. Chaptal has found to succeed best, is described by Mr. Baumé. Six drams of the solution of silver, and four of that of mercury, both well saturated, are taken, and diluted with five ounces of distilled water. These are to be put into a conical vessel; and an amalgam of seven parts of mercury, and one of silver, is to be poured in; a multitude of small crystals instantly appear to disengage themselves from each other; and a vegetation is produced, which perceptibly rises under the eye of the spectator. To render this phenomenon still more striking, the exhausted water should be decanted, and fresh substituted: by this means any vessel whatever may be filled with these vegetations. The mercury which is amalgamated with the silver, in this operation, may be separated by means of heat.

The muriatic acid does not dissolve silver, though it speedily dissolves its oxides; but the oxigenated muriatic acid dissolves this metal.

In order to produce a certain and speedy combination of the muriatic acid with silver, the acid must be poured into a solution of the nitrate of silver. A precipitate immediately falls down, which is known by the name of *Luna Cornea.* This muriate of silver is very fusible; and runs into a grey and transparent substance, resembling horn in a considerable degree. If a stronger degree of heat be applied, it is decomposed, one part being volatilized, and the other reduced into silver. If the muriate of silver be exposed to the light of the sun, it becomes brown in a short time. Oxigenous gas is disengaged; which, according to the process of Mr. Berthollet, may be collected by placing it under water. Most of the solutions of metals have the same property. *Lunar nitre* also becomes coloured, and emits its oxigene and nitrous gas. From the observations of Mr. Monet, it appears that one pound of boiling water does not dissolve more than three or four grains of muriate of silver. The alkalis are capable of decomposing the muriate of silver, and separating the metal. The silver may also be disengaged from its muriate by fusion with three parts of black flux.

The following process has been described by Mr. Berthollet, as forming the most dreadful and most astonishing fulminating powder that has yet been discovered: take fine silver of cupellation, and dissolve it in the nitric acid: precipitate this solution by lime-water, decant the water, and expose the oxide for three days to the air. Mix this dried oxide in ammoniac, or volatile alkali, and it will assume the form of a black powder: decant the

fluid, and leave the powder to dry in the open air. This is the *Fulminating Silver*. Mr. Berthollet is of opinion that the presence of light has some influence in the success of this experiment.

Neither gunpowder, nor even fulminating gold itself, can be compared with this new product.—The contact of fire is necessary to cause gunpowder to detonate; and a determinate degree of heat is required to cause fulminating gold to fulminate: but the contact of a cold body is sufficient to produce the detonation of fulminating silver. In short, this product, when once obtained, can no longer be touched: no attempts must be made to inclose it in a bottle, but it must be left in the capsule wherein the evaporation was performed. It is hardly necessary to observe, that the fulmination ought not to be attempted but with a small quantity; the weight of a grain, for instance: for a larger mass would give rise to a dangerous detonation. In making this preparation it is necessary to have the face covered with a mask with glass eyes; and it is prudent to dry the fulminating silver in small metallic capsules. The following experiment will furnish a sufficient idea of the fulminating property of this preparation: take the ammoniac which was used in the conversion of the oxide of silver into the black precipitate which forms fulminating silver; put this ammoniac into a small matrass of thin glass, and let it be subjected to the degree of ebullition necessary to complete the combination. Take the matrass from the fire; and a rough covering of crystals will be formed on its internal surface which is beneath the fluid. If one of these crystals beneath the cold fluid be touched, an explosion takes place which breaks the matrass. In respect to the theory of this phenomenon, it is the same as that of fulminating gold, which has been given by Berthollet, in the Memoirs of the Royal Academy of Sciences for the year 1785. In this operation, the oxigene, which adheres very slightly to the silver, combines with the hydrogene of the ammoniac. From the combination of the oxigene and the hydrogene, water, in the state of vapour, is produced. This water, instantly vaporized, and possessing all the elasticity and expansive force of that state, is the principal cause of the phenomenon; in which the nitrogene, which is disengaged from the ammoniac, with its whole expansibility, likewise bears a principal part. After the fulmination, the silver is found reduced or revivified; that is to say, it has resumed its metallic state. It again becomes the same white, brilliant, and pure metal which it was when taken out of the cupel. Silver is alloyed with copper, to form solder; whence it happens that silver utensils are subject to rust, and form verdigris, at the places where they are soldered.

ARGE'NTUM NITRA'TUM; *nitras argenti*, or *causticum lunare*, a preparation of silver used in medicine. It is called *nitras argenti fusus* in the new chemical nomenclature. Its virtues are corrosive and astringent. Internally it is exhibited, in very small quantities, in epilepsy; and externally, it is employed to destroy fungous excrescences, callous ulcers, fistulas, &c. In the latter disease it is employed as an injection; from two grains to three being dissolved in an ounce of distilled water.

Argentum Nitratum. Lond.

Take of Silver, one ounce;
Diluted nitrous acid, four ounces, by measure.

Let the silver be dissolved in a glass vessel, upon warm sand: then gently increase the heat, until a dry mass be left. Melt this in a crucible, carefully avoiding too much heat, and pour it into moulds of a convenient form.

By the Edinburgh College it is prepared thus:

Take of the purest silver, flatted into plates, and cut into pieces, four ounces;
Diluted nitrous acid, eight ounces;
Distilled water, four ounces.

Let the silver be dissolved in a phial, by a gentle heat, and the solution evaporated to dryness. Put the mass into a large crucible, and place it in the fire; which must at first be gentle; augment it by degrees, until the mass flow like oil: then pour it into iron pipes made for this purpose, previously heated and greased. Keep it for use in a glass vessel close stopped.

Strong spirit of nitre will dissolve somewhat more than half its weight of pure silver; and the weaker kinds of aqua fortis, commonly distilled from calcined vitriol and nitre, proportionably less, according to their quantity of pure nitrous acid. Sometimes this spirit contains a portion of the vitriolic or marine acids; which, however minute, renders it unfit for dissolving this metal, and should therefore be carefully separated before the solution is attempted. The method which the refiners employ, for examining the purity of their aquafortis, and purifying it if necessary, is, to let fall into it a few drops of a perfect solution of silver already made. If the liquor remain clear, and grow not in the least turbid or whitish, it is fit for their use; otherwise, they add a small quantity more of the solution, which immediately turns the whole of a milk-white colour: the mixture being then suffered to rest for some time, deposits a white sediment; from which it is warily decanted, examined afresh, and, if need be, further purified, by a fresh addition of the solution.

The silver, flatted into thin plates, as directed in the second of the above processes, needs not to be cut in pieces: the solution will go on the more speedily, if they be only turned round into spiral circumvolutions, so as to be conveniently got into the glass, with care that the several surfaces do not touch one another. By this management, a greater extent of the face is exposed to the action of the menstruum, than when the plates are cut in pieces and laid above one another. Good diluted nitrous acid will dissolve about half its weight of silver, and it is not advisable to use a greater quantity of the menstruum than is sufficient for effecting the solution; for all the surplus must be evaporated in the subsequent fusion.

The crucible ought to be large enough to hold five or six times the quantity of the dry matter; for it bubbles and swells up greatly, so as otherwise to be apt to run over. During this time, also, little drops are now and then spirted up, whose causticity is increased by their heat, and against which the operator ought therefore to be on his guard. The fire must be kept moderate till this ebullition ceases, and till the matter becomes consistent in the heat that made it boil before: then quickly increase the fire till the matter flows thin at the bottom, like oil. It is now to be immediately poured into the mould, without waiting till the fumes cease to appear; for when this happens, the preparation proves not only too thick to run freely into the mould, but likewise less corrosive than it is expected to be in its qualities.

In want of a proper iron mould, one may be formed of tempered tobacco-pipe clay, not too moist, by making, in a lump of it, with a small stick first greased, as many holes as there is occasion for: pour the liquid matter into these cavities, and, when congealed, take it out by breaking the mould. Each piece is to be wiped clean from the grease; and wrapt up in dry soft paper, not only to keep the air from acting upon them, but likewise to prevent their corroding or discolouring the fingers in handling.

ARGE'NTUM VI'VUM; Quicksilver. See Hydrargyrus.

ARGILLACEOUS EARTH, *(terra argillacea)*; Clay. See Alumine.

ARI'DITAS CO'RPORIS, a term used by ancient writers to denote a marasmus.

ARIDU'RA, wasting or leanness, such as appears in hectic or in consumptive habits: or, according to some, the withering of a limb, or of any particular part.

ARI'LLUS, (from *arere*, to be *dry* or *parched)*, a term invented by Linnæus, and defined to be the proper exterior covering of the seed, which, *drying*, separates spontaneously.

All kinds of seeds are not furnished with an *arillus;* in many, a dry covering, or scarf-skin, supplies its place. In jessamine, hound's-tongue, *cynoglossum;* cucumber, fraxinella, *dictamnus;* the staff-tree, *celastrus;* spindle-tree, *euonymus;* African spiræa, *diosma;* and the coffee-tree, *coffea;* it is very conspicuously seen. In hound's-tongue, four of these *arilli*, or proper coats, each enfolding a single seed, are affixed to the style; and in this circumstance, Linnæus says, the essence of the genus consists.

The *Arillus* is either: 1. *Baccatus*, i. e. succulent, and of the nature of a berry, as in the spindle-tree, *euonymus.* 2. *Cartilagineus*, cartilaginous, as in the African spiræa, *diosma*, 3. *Coloratus*, coloured, as in the staff-tree. 4. *Elasticus*, endued with an elastic power designed for dispersing the seeds; as is remarkable in the African spiræa, *diosma;* and in the fraxinella. 5. It may be *scaber*, rough, and knotty, as in hound's-tongue.

Although covered with an *arillus*, or other dry coat, seeds are said to be *nuda*, naked, when they are not inclosed in any *pericarpium;* as in the grasses, and the lipped flowers of Tournefort; which correspond to the *didynamia gymnospermia* Linn. The *arillus*, by some former writers, has been styled *Calyptra.* See Calyptra. By Scopoli, it is termed *Theca*, a *sheath* or case.

ARIMA'SPES, a name of the ancient people of Scythia, who are fabulously said to have had but one eye. In the Scythian language, *Ari* signifies *alone*, and *Maspe*, *the eye.* This word is also synonimous with Monopia.

ARI'STA, (from *areo*, to be *dried);* the awn, or sharp beard, issuing from the husk, or scaly flower-cup, of the grasses, called *Gluma.* See Gluma. Most of the plants that belong to the natural order of grasses, are *hermaphrodite*, that is, bear flowers, which have the stamina and pistil within the same covers. Some of them, however, are *androgynous*, that is, have both male and female flowers, produced on the same plant; as is the case in the genera *zea*, *coix*, *olyra*, *tripsacum*, *zizania.* Others are *polygamous*, bearing hermaphrodite flowers, and flowers of either, or of both sexes, on the same, or on different roots: as the genera *andropogon*, *holcus*, Indian millet. See Polygamia.

The hermaphrodite grasses are all, except in the instances of vernal grass, *anthoxanthum;* *cinna*, and rice, *oryza;* reduced under Linnæus's third class, *triandria;* the androgynous belong to the class *Monœcia;* and the polygamous to the *Polygamia.* Of the hermaphrodite grasses, some are without the arista, as the genus *poa.* A like deficiency is also observed in the genera *zea*, *coix*, *&c.* which are ranked under the head of androgynous grasses. Both male and female flowers of the genus *olyra*, have one of the valves only of the husky calyx terminated with an arista. The male flower of the genus *zizania*, wants this appendage; but the

husky corolla of the female, at the termination of its large outward valve or petal, is furnished with a long one.

Of the polygamous grasses, the *andropogon* and *holcus* are without the *arista* in the calyx; the husk of the corolla of the hermaphrodite flower, in the former, has a long, sharp, and twisted beard, proceeding from the base of the greater valve: in the latter, the outward valve is furnished with a very rigid beard of the same kind. The inner valve is without. The valves of the husky calyx of the hermaphrodite flower, in the genus *ægilops*. (See Ægilops), are furnished with beards; as is the husky corolla, in the same genus, with one that is double or triple; but the inner valve has none.

Aristæ are of the following kinds: 1. *Divaricatæ*, i. e. placed at a considerable distance from each other, being opposed to *confertæ*, as in *bromus squarrosus*. 2. *Dorsales*, fixed to the back, or outer part of the husk, as in the oat, and the foxtail grass, *alopecurus*. 3. *Erectæ* and *rectæ*, i. e. upright, as in *bromus*, and winged spike-grass, *stipa*. 4. *Filiformes*, or thread-shaped, as in the *aristæ* of a species of panic-grass, called by Linnæus, *panicum hirtellum*. 5. *Glutinosæ*, covered with an adhesive glue; as in the *panicum hirtellum*. 6. *Geniculatæ*, jointed; as in the vernal grass, *anthoxanthum*. 7. *Læves*, polished, or without any roughness; as in *avena fatua*. 8. *Lanatæ*, woolly; as in *stipa pennata*, and *aristida plumosa*. In the last genus, there are three *aristæ;* the intermediate one only is woolly. 9. *Longissimæ;* as in winged spike-grass, *stipa*. 10. *Patulæ*, *spreading;* as in the *aristida*, and *bromus scoparius*. 11. *Pilosæ*, hairy; as in *stipa tenacissima*, where the *aristæ* are hairy at the base. 12. *Plumosæ*, feathery; as in the *geum*. 13. *Recurvæ*, bent backward; as in *andropogon*, and *agrostis canina*. 14. *Retortæ* and *Reflexo-tortæ*, twisted backwards; as in one of the *aristæ* of the genus *laguras*. 15. *Sanguineæ*, of a blood-colour; as in the *panicum hirtellum*. 16. *Setaceæ*, bristly; as in the *agrostis canina*, and *hordeum jubatum*. 17. *Terminales*, i. e. fixed to the apex of the husk, as in the *olyra*. 18. *Tortiles*, wreathed; as in *andropogon*, *stipa*, and *aira montana*. The aristæ of the oat are twisted into a spiral form. 19. *Villosæ*, villous, like velvet. This is almost synonimous with *pilosæ;* and is exemplified in the *lagurus*. 20. *Uncinatæ*, hooked; as in the *panicum hirtellum*, and *geum urbanum*.

It may farther be observed, that, the seeds of *geum*, herb-bennet, are furnished with long jointed beards.

ARISTOLO'CHIA, (from αριςος, *good;* and λοχια or λοχεια, *parturition;* so called because it was supposed to be of sovereign use in disorders incident to child-birth); BIRTHWORT. This is a genus of the hexandria order, belonging to the gynandria class of plants. There are 21 different species; but the four following merit description most particularly.

1. The *rotunda*, is a native of the south of France, of Spain, and Italy, from whence the roots are brought for medicinal use. The roots are roundish, grow to the size of small turnips, being in shape and colour like the roots of cyclamens, which are frequently sold instead of them. This sort has three or four weak trailing branches, which lie on the ground when they are not supported, and extend two feet in length; the leaves are heart-shaped and rounded at their extremity; the flowers come out singly at every leaf, toward the upper part of the stalk. They are of a purplish black colour; and are frequently succeeded by oval seed-vessels, having six cells, full of flat seeds.

2. The *longa*, is a native of the same countries. Linnæus defines it, *aristolochia*, *foliis cordatis petiolatis integerrimis obtusiusculis*, *caule infirmo*, *floribus solitariis*. This species has long tap-roots like carrots; the branches are weak and trailing, extending little more than a foot; the flowers come out from the wings of the leaves like the other, of a pale purple colour, and are frequently succeeded by seed-vessels like the other.

3. The *serpentaria*, is a native of Virginia and Carolina, from whence the *radix serpentariæ*, so much used in medicine, is brought over. The plant rises out of the ground in one, two, and sometimes three pliant stalks, which at every distance are crooked or undulated. The leaves stand alternately, and are about three inches long, in form somewhat like the smilax aspera. The leaves grow close to the ground on footstalks an inch long, of a singular shape, and of a dark purple colour. A round canulated capsule succeeds the flower. It is filled with seeds, which are ripe in May. The usual price of the root, when dried, is sixpence a pound, both in Virginia and Carolina, which is money hardly earned; yet the negro slaves employ great part of the time allowed them by their masters in search of it, which is the reason that there are seldom found any but very small plants of this species. When they are planted in gardens in those countries where they are natives, the plants increase so much in two years' time, that the hand can scarce grasp the stalks of a single one. This species delights in woods, and is usually found near the roots of great trees.

4. The *Indica*, or contrayerva of Jamaica, is a native of that island, where its roots are used instead of the true contrayerva. It has long trailing branches, which climb upon the neighbouring plants, and sometimes rise to a considerable height. The flowers are produced in small clusters towards the upper part of the stalks, which are of a dark purple colour.

The first, second, and third sorts are propagated from seeds, which should be sown in the autumn, in pots filled with light fresh earth, and placed under a frame to preserve them from the frost. If they are plunged into a gentle hot-bed in the month of March, the plants will come up the sooner. In summer, and in autumn when the stalks begin to decay, they must be watered. In winter they must be again sheltered; and in March, before the roots begin to shoot, they must be transplanted into small separate pots filled with light earth, when they may be removed into the open air, and treated as before. The next spring, they may be planted in the open air in a warm border; where, in the autumn, when their stalks decay, if the border is covered with old tanners bark to keep out the frost, the roots will be secured; but where this care is not taken, they will frequently be killed by the frost. The fourth is tender; and therefore must be kept in a stove during the winter, or it will not live in England.

With regard to the *medicinal uses* of aristolochia, the roots of the long and round sorts, on being first chewed, scarcely discover any taste, but in a little time prove nauseously bitterish; the long somewhat the least so. The other sort instantly fills the mouth with an aromatic bitterness, which is not ungrateful. Their medical properties are heating, stimulating, and attenuant, and as they promote the fluid secretions in general, they are principally celebrated in suppressions of the menses in females. The dose in substance is from a scruple to two drachms. The long sort is recommended externally for cleansing ulcers, and in cutaneous diseases.

The root of the serpentaria is small, light, bushy, and consists of a number of strings or fibres, matted together, issuing from one common head; of a brownish colour on the outside, and paler or yellowish within. It has an aromatic smell, like that of valerian, but more agreeable; and a warm, bitterish, pungent taste. This root is a warm diaphoretic and diuretic; it has been greatly celebrated as an alexipharmic, and esteemed one of the principal remedies in malignant fevers and epidemic diseases. With these intentions, it was given by Dr. Lind, and other physicians in the irregular tertian fevers in hot climates. See Amphimerina. It is given in substance from ten to thirty grains; and in infusion, to a drachm or two. Both watery and spirituous menstrua extract its virtue by infusion, and elevate some share of its flavour in distillation; along with the water a small portion of essential oil arises.

Of the aristolochia, Dr. Cullen expresses himself in the following terms in his Treatise on the Materia Medica.

"Which of the species of this genus," says he, "are to be preferred, I cannot determine; and believe the difference between the rotunda, longa, and tenuis, is not considerable, though the latter seems now to be preferred by both the colleges of London and Edinburgh. They are all of them considerably bitter, with more acrimony than in any other of the bitters commonly employed. Its name seems to have arisen from the supposition of its emmenagogue virtues, and in some cases of retention and chlorosis, as a warm and stimulating medicine, I have found it useful; but in cases of suppression I never found it of any use: and the commendation of it, by the ancients, in promoting the lochia, facilitating birth, and promoting the exclusion of the secundines, is very ill founded, and affords a remarkable instance of their imperfect knowledge; and an example which, if followed, would lead to a mischievous practice.

"The aristolochia has been long commended as a cure for the gout. It makes a considerable part of the Portland powder, and has often been employed by itself in the same manner as that powder, to be taken every day for a great length of time. It has the same power of preventing fits of the gout, and commonly with the same consequences; of which many instances are recorded by the physicians of Germany." See Amara.

"The species of aristolochia named *serpentaria*, has very much of the qualities of the genus; but by accident, this and the other species of aristolochia have been considered as very different. This, both in taste and flavour however, is more agreeable than the other species, and it is by its sensible qualities of bitterness and aromatic acrimony that we can account for the virtues so justly ascribed to it.

"Both these qualities render it antiseptic, and powerfully tonic; and therefore suited to prevent gangrene. The same qualities will account for its cure of intermittent fevers, especially when combined with cinchona and astringent substances.

"By its aromatic acrimony it proves powerfully stimulant to the system; and therefore is useful also in some cases of continued fevers: but as the cure of either intermittent or continued fevers by stimulants alone is an ambiguous and dangerous practice, so in the former it is only safe when joined with the bark; and the use of it in continued fevers is to be attempted with much caution. The common opinion of its alexipharmic powers, both with respect to it and all the others which have gone under the same title, is an incorrect and false notion, liable to much abuse, and which I myself have had occasion to observe. The stimulant power of the serpentaria is especially suited to the low and advanced state of the typhoid fevers only; and even then it will be more safe to join it with the bark than to employ it for its stimulant power alone." Dr. Cullen adds, that it is owing to this ambiguity in its use, that it is not nearly so much

employed in practice as it was thirty or forty years ago.

ARISTOLOCHIA ANGUICIDA, snake-killing birthwort; the *Aristolochia anguicida; foliis cordatis, acuminatis; caule volubili, fruticoso; pedunculis solitariis; stipulis cordatis* Linn. It is said that the juice of the root of this plant has the property of so stupefying serpents, that they may be handled with impunity. So ungrateful, at least, is the smell of the root to those reptiles, that they immediately turn from it. The juice is also reckoned, by the vulgar, a preventive against bites of venomous serpents, but this probably is a mere fable.

ARISTOLOCHIA CLEMATITIS, (called *clemantitis*, κλημαλιλις; from κλημα, a tendril, from its climbing up trees or any thing it can fasten upon with its tendrils); the systematic name of the *aristolochia vulgaris* of the pharmacopœias. See Aristolachia vulgaris.

ARISTOLOCHIA FABACEA. The root of this plant, which is the *fumaria bulbosa; caule simplici, bracteis longitudine florum* Linn. was formerly given to restore suppressed menses, and as an anthelmintic, but it is now laid aside.

ARISTOLOCHIA LONGA; the systematic name for the aristolochia of the pharmacopœias. See Aristolochia.

ARISTOLOCHIA ROTUNDA. The root of this species, which is the *Aristolochia rotunda; foliis cordatis, subsessilibus, obtusis; caule infirmo; floribus solitariis* Linn. is used indiscriminately with that of the *aristolochia longa.* See Aristolochia.

ARISTOLOCHIA SERPENTARIA; the systematic name for the *serpentaria Virginiana* of the shops. See Aristolochia.

ARISTOLOCHIA TENUIS. See Aristolochia vulgaris.

ARISTOLOCHIA TRILOBATA; three-lobed birthwort. *Aristolochia trilobata; soliis trilobis, caule volubili, floribus maximis.* This plant is diuretic, and is employed in America against the bite of serpents.

ARISTOLOCHIA VULGARIS, this species, also named *tenuis*, is the *Aristolochia clematitis; foliis cordatis; caule erecto; floribus axillaribus confirtis* Linn. An extract is prepared from this species by the Wirtemberg pharmacopœia, and the plant, till of late, was retained in that of Edinburgh. It is said to possess antipodagric virtues.

A'RMA, a term in botany, denoting one of the seven kinds of *fulcra*, or props of plant, enumerated by Linnæus in the *Delineatio Plantæ*, at the beginning of his System of Nature; and by Elmgren, in his *Termini Botanici.* For the numerous variations these *fulcra* have undergone, see the article Fulcra. The different species of armour with which plants are furnished, are *aculei*, prickles; *spinæ*, thorns; *furcæ*, forks; and *stimuli*, strings. See Aculeus, Spina, &c. They are intended by nature, as it should seem, to keep off animals from hurting the plants, whence their name.

A'RMENA BOLUS, Armenian bole. See Bole.

A'RMENUS LAPIS, *Armenian stone*, a mineral substance, which is but improperly called a *stone;* being no other than an ochreous earth, and properly called *blue ochre.* It is a very beautiful earth, resembling lapis lazuli, of an even and regular texture; and of a fine blue, sometimes deeper, sometimes paler, and frequently mixed with green. It is soft, tender, and light; of an even, but somewhat dusty, surface; it adheres firmly to the tongue, and is dry, but not harsh to the touch. It easily breaks between the fingers, and does not stain the hands. It is of a brackish disagreeable taste, and does not ferment with acids. It is a very scarce fossil; but found very pure, though in but small quantities, in the mines at Gosselaer, in Saxony. It is frequently found spotted with green, and sometimes with black: and very often is mixed among the green ochre, called *berggruen* by the Germans, which and thence been erroneously called by its name.

ARMI'LLA; the round ligament that confines the tendons of the *carpus.*

ARMO'NIAC; a popular name for Ammoniac.

ARMORA'CIA; from *Armorica*, (the country from whence it was brought); a name for horse-radish. See Raphanus rusticanus.

ARNA'LDIA; a malignant slow disease, of the chronical kind, attended with an *Alopecia.* It was formerly very common in England.

ARNI'CA, *Leopard's bane*, a genus of the polygamia superflua order, belonging to the syngenesia class of plants. There are seven species, all of which are natives of Ethiopia, except the two following: 1. The *arnica montana*, with oval leaves, grows naturally on the Alps, and also upon many of the high mountains in Germany, and other cold parts of Europe. The roots of this species, when planted in a proper soil and situation, spread very far under the surface, and put out many entire oval leaves, from between which the flower-stems arise, which grow about a foot and an half high. The top is terminated by a single yellow flower, composed of many florets, like those of the dandelion. These are succeeded by oblong seeds, which are covered with down. 2. The *scorpioides*, with sawed leaves growing alternately, is a native of Bohemia and Siberia. The roots of this sort are much jointed, and divide into many irregular fleshy off-sets, which are variously contorted; from whence some superstitious persons have imagined, that they would expel the poison of a scorpion, and cure the wounds made by the sting of that animal.

The first species grows in moist shady situations.

It may be propagated by parting the roots in autumn, when the stalks begin to decay; or by the seeds sown in autumn, soon after they are ripe, for those sown in the spring often fail. The second sort is to be propagated in the same manner. Both are very hardy plants, and require but little care.

ARNI'CA MONTA'NA, (αρνικη; from αρς, a lamb; because of the likeness of the leaf of this plant to the woolly coat of the lamb), otherwise named *Doronicum Germanicum.* Mountain arnica; the *Arnica montana* Linn. *Arnica, foliis ovatis integris; caulinis geminis oppositis.* Class, *Syngenesia.* Order, *Polygamia superflua.* The flowers of this plant are very generally employed on the continent. They have a weak bitter taste, evidently combined with a degree of acrimony, and when rubbed between the fingers, they afford a somewhat aromatic smell. Their active properties are not sufficiently ascertained. They evidently contain a great deal of resin, and some essential oil. Employed in medicine, their effects are stimulating, and supposed to be discutient. In small doses, and properly administered, they possess very beneficial effects, in raising the pulse, in exciting the action of the whole sanguiferous system, in checking diarrhœas and bilious dysenteries where the functions of the intestines have been impaired, in promoting expectoration, and, above all, in removing paralytic affections of the voluntary muscles; but their use is frequently attended with no sensible operation, except that in some cases of paralysis, the cure is said to be preceded by a peculiar prickling, or rather shooting, pain in the affected part. When given in too large doses, they excite an insupportable degree of anxiety, shooting and burning pains, and even dangerous hæmorrhagies, vomiting, vertigo, and coma. For these dangerous symptoms, vinegar is said to be the best remedy, as in the cases of narcotic vegetables taken as poisons.

The flowers of the arnica montana have been recommended by physicians. 1. In paralytic disorders, chronic rheumatism, and retention of urine, from paralysis of the bladder. 2. In amaurosis. 3. In intermittent fevers, combined with Peruvian bark. 4. In dysentery and diarrhœa, but sometimes with bad effects in these. 5. In putrid diseases. 6. In typhoid inflammations. 7. To promote the uterine discharges in women. 8. In internal pains, and congestions from bruises. In the countries where this plant is indigenous, the flowers of the leopard's-bane have long been a popular remedy in the cases here mentioned.

Their use, on the other hand, is contraindicated by an inflammatory diathesis, a predisposition to hæmorrhage, and internal congestions of the fluids.

Dr. A. Duncan says, the flowers are best exhibited in the form of infusion. " One or two scruples may be infused with half a pound of water, and taken at proper intervals. The flowers should be wrapt up in a piece of linen, as otherwise their down is apt to be diffused in the liquid, and to cause violent irritation in the throat."

The dried *root* of this plant has also been employed in medicine. It is about the thickness of a small quill, and sends out fibres along one side. Externally it is rough, and of a red brown colour, internally of a dirty white. Its taste is acrid, and slightly bitter. Neumann extracted from 960 parts 840 watery extract, and 5 alkoholic, and inversely 270 alkoholic, and 540 watery. The root has been exhibited in the same manner and circumstances as the flowers, but it is more apt to vomit. In powder the dose is from five to ten or twelve grains.

ARNI'CA SUEDE'NSIS. See Conyza media.

ARNO'TTO. See Galeana.

ARO'MA, (αρωμα, *odour;* from αρι, *intensely,* and οζω, to *smell).* Each plant has its characteristic smell, and this odorant principle is called by the moderns *aroma.* Water charged with aroma is called the distilled water of the substance made use of; thus lavender and peppermint waters are water impregnated with the aroma, or essential oil, of the lavender and peppermint.

ARO'MATA, (from αρωμα, *odour);* the systematic name for certain acrid substances that we use as medicine, or take in to give more taste to our aliment; for though the food, to be wholesome, should be bland; yet the system requires it should also be sapid, or savoury. This advantage, Dr. Cullen observes, is obtained from the aromata, which strictly are such substances as are pungent, together with some degree of fragrancy, as cinnamon, cloves, nutmegs, mace, pimento, &c. which are the produce of the warmer climates. Analogous to these, in Europe, are the umbelliferous seeds, as anise, carraway, coriander, and also the sweet herbs. All these stimulate the stomach, and promote the peristaltic motion. They are antispasmodic, taking off the spasms arising from the flatulency of our food, and antiseptic, moderating the putrid tendency of the aliment in the intestines. From these qualities they are fitly conjoined with our vegetable food, stimulating the stomach, promoting the mixture and afflux, in proper quantity, of the animal fluids, and obviating the effects of flatulency. " They ought properly," says Dr. Cullen, " only to be used in those countries where they are produced; because, from the heat of the climate, people there live chiefly on vegetable diet. They are introduced, with us, unfitly, and as a part of luxury, as any antiseptic virtue they have would be overcome by their stimulus, &c.

" There are certain acrid plants, the produce of our Northern climates, where animal food is indulged most freely and safely, and where that be-

ing insipid, is fitly conjoined with these acrid substances, as condiments."

We have vegetables of the cress kind, radishes, horse-radish, mustard, and indeed all the *siliquosæ.* These give taste to insipid aliment, stimulate the stomach, and increase the peristaltic motion; they have no considerable antispasmodic virtue, are manifestly powerful diuretics and diaphoretics, stimulating the excretories to throw out alkalescent matters. Hence they are fitly conjoined with animal food. The garlic tribe have the same virtues, stimulate the stomach, are diuretic and diaphoretic, and are used with animal food as condiments.

AROMATA, (αρωματα), spices, herbs, seeds, &c. which contain an essential oil. This is the name of a division in Ray's, Monti's, and Sceuchzerus's botanical arrangements of the grasses; consisting of such as have an odoriferous quality.

AROMA'TICA. See Aromata. Such medicines are termed aromatics, as, to a pungent acrid taste, join a fragrant odour of the agreeable kind. They all abound in an essential oil, which in the proper aromatics is specifically heavier than water; and they are generally natives of the Torrid Zone. Dr. Cullen observes, that all of them have qualities very much in common. They stimulate the stomach, assist digestion, and increase appetite; in a stronger degree take off spasms in the *primæ viæ*, by maintaining the stronger action of the stomach; take off spasms arising from vegetable aliment, and, in general, except in inflammatory cases, are useful in all spasmodic affections of the alimentary canal. However, they seem rather appropriated for relieving those spasms when they occur, than to obviate them. Nothing is more common, than to give aromatics, with purgatives of a nature which are liable to produce spasms; but in obtaining this object we are frequently disappointed. On other occasions, aromatics are used in all cold diseases of the head and brain, in all languors of the system, and, in short, for all the purposes of stimulants. All of them are of an inflammatory nature, having their virtue depending on an essential oil, and apt to inflame the part to which they are applied. Those aromatics are most so which have this oil in greatest quantity, and of the most acrid kind. See Materia Medica.

They have been employed in the case of intermittent fevers, in order to obviate the return of the fit, but by this practice we are always liable to change an intermittent into a continued fever. Many intermittents are of an inflammatory nature, especially those of the spring season; and in these especially would aromatics be improper. These are the virtues of aromatics in general, and are applicable to each.

The *canella alba*, *cortex winteranus*, and *ginger*, are of an inferior degree of fragrancy, but still are entitled to be ranked with the others. Some of the peppers and *capsicum* have little odour, but yet possess the most poignancy of taste, and are the most powerful; which is an evidence of the small efficacy of odour in giving virtue; and from this want of odour they are more recommended in food in certain circumstances. The essential oil extracted from these, Dr. Cullen says, is milder than their substance; which shows, we should not always suppose we have extracted all the virtues, where we have extracted the essential oil, for often that is so heavy as not to rise. Alkohol, in such cases, affords the best impregnation. Pepper, like mustard, can be taken in six times the quantity, when whole, as in powder, without producing the same heat. In intermittents, where pepper is commended, this is the proper method of exhibition; for by this means the stomach cannot extract such a considerable quantity at a time as to produce inflammation.

The next three have not an odour of the fragrant kind, and therefore are not used in food. They have no other virtues but those of the foregoing, and might be safely rejected, were it not to afford that variety which is sometimes required to adapt stimulants to particular cases.

"*Galangals*," says Dr. Cullen, "were introduced when we were in the humour of introducing every other medicine. It is neither agreeable in odour nor taste, and is the weakest of the class, and, therefore, now properly rejected.

"*Zedoary* has a penetrating odour, like that of camphire, and is said to afford a concrete of much the same nature, and, therefore, probably has antispasmodic virtues, which, however, are not yet ascertained.

"*Serpentaria virginiana* contains an acrid essential oil, and, therefore, is possessed of the virtues of the aromatics. Its odour approaches nearly to that of valerian. Perhaps it is too frequently prescribed in the Edinburgh Dispensatories; since, as an aromatic, it is less agreeable than many of the others. It is supposed to be possessed of peculiar virtues. It is almost the only aromatic we use in continual fevers, and I have seen it of good effect in typhous fever, raising the pulse, diminishing its frequency, and bringing the fever to a happy issue. It is certainly preferable to the *contrayerva.* We call those fevers typhous, in which there is always a languor of the *vis vitæ*, and of the nervous power. When this proceeds to a higher degree, and is accompanied with putrefaction, we call the fever malignant. In the last case, namely, in malignant fever, the *serpentaria* is often evidently useful, and in the beginning of typhous fevers, where there is no manifest putrefaction, it is often of pernicious consequence. Sir John Pringle has been very attentive to malignant fevers, and deserves great praise for his observations on them, though sometimes he is

apt to suppose their existence oftener than it really is. From his notion of antiseptics he was led to exhibit the *serpentaria*. But he himself gives us a caution, though prejudiced in its favour, viz. that he was now and then obliged to diminish his dose, from the *heating* effects of this medicine. These heating effects are not always to be measured by the temperature of the skin, but sometimes by the frequency of the pulse."

Dr. Cullen next mentions the *malabathrum* and the two *nardi*, which he says, are now entirely neglected, as containing somewhat of aromatic virtue, but so weakly, that they have neither deserved nor obtained much reputation. Other aromatics in the Doctor's catalogue are these:

" *Lilium convallium.* This," he says, " is an instance of odour introducing a substance into medicine improperly. Though agreeable and fragrant, yet it is an acrid, even poisonous substance, and, as having no virtues depending on its odour, it should be carefully avoided.

" *Ginseng.* This, like other substances which have come into common use, has had great virtues ascribed to it, especially in the countries where it is found growing. It is a mild aromatic, and, to those who require such amusement, a safe masticatory. It may be of use, but the weakness of its sensible qualities give it no foundation for a place in medicine. The engaging virtue of a powerful incentive and aphrodisiac has been attributed to it, but on the most slender, and, indeed, absolutely false, foundation.

" *Cascarilla.* In this country, this is not sufficiently known as a medicine; but it has been much used in Germany, and other countries. Its history is related by Geoffroy, and transcribed by Dr. Lewis. It belongs to a set of plants, which contain an acrid and somewhat of a poisonous nature. Its oil is very inflammatory, and as an irritating medicine, and heating the system, it promotes sweat. In some cases it may be useful; in those, for instance, in which the Germans recommend it. It has somewhat of a narcotic power, and as a bark, is manifestly astringent. G. Alpinus employed it in malignant fevers. Juncker says it does not answer in present practice; but that may often happen, from our not knowing the cases to which it is appropriated. Juncker and Stahl recommend it in intermittents, but in these it is by no means equal to cinchona, which Stahl, from his system, avoided. From its astringent and narcotic qualities, it may have been useful in those cases, in which the French physicians have employed it, and its other sensible qualities will explain its use in other cases. Stahl recommends it in peripneumony, and diseases of the breast; but he excepts the *angina*, which makes one very doubtful about its use in the other cases."

These are sufficient as specimens of the *aromata fragrantiora*. Dr. Cullen adds to them *aspalathas* and *rhodium*, but on which, he says, no virtues seems to depend, except that of a cordial. They seem, of course, to be very properly neglected in modern practice, and more to be regarded as articles for the perfumer than the physician.

AROMATICÆ, in botany, plants which are odoriferous, of a strong agreeable smell and taste. They give name to a class in Dioscorides, Clusius, Hernandes, J. Bauhin, Johnston, Rumfius, and several other botanists, who have arranged plants by their virtues and sensible qualities. Plants of the order *didynamia gymnospermia* of Linnæus, which correspond to the *labiata* of Tournefort, are all aromatics.

AROMATIC POWDER, the pulvis aromaticus of the Dispensatories.

Pulvis Aromaticus. Lond. Dubl.

Take of Cinnamon, two ounces;
Smaller cardamom seeds, husked;
Ginger,
Long pepper, of each one ounce.
Rub them together to a powder, which should be kept in a well stopped glass bottle, to prevent the escape of its volatile parts.

Pulvis Aromaticus. Edin.

Take of Cinnamon,
Smaller cardamom seeds,
Ginger, of each equal parts.
Reduce them to a very fine powder.

These compositions are agreeable, hot, spicy, medicines; and as such may be useful for warming the stomach, promoting digestion, and strengthening the tone of the viscera. The dose is from ten grains to a scruple and upwards. The London formula is considerably the warmest, from the quantity of long pepper which it contains.

The aromatic powder enters into the following officinal preparations.—Pulvis aloet. cum guaiac. *Lond.* Elect. aromat. *Edin.* Elect. opiat. *Edin.*

AROMATIC ELECTUARY, a compound consisting of powdered aromatic substances and syrup.

Electuarium Aromaticum. Edin.

Take of Aromatic powder, one part;
Syrup of orange-peel, two parts.
Mix them well together, so as to form an electuary.

The Dublin College order this remedy in the following terms:

Electuarium Aromaticum. Dubl.

Take of Conserve of orange-peel, three ounces;
Cinnamon,

Nutmegs, of each, in powder, half an ounce;
Ginger, in powder,
Saffron, of each two drachms;
Double refined sugar, one ounce;
Syrup of orange-peel, as much as may be necessary to form an electuary, by beating the ingredients well together.

In the London Pharmacopœia this remedy varies both in composition and name:

Confectio Aromatica. Lond.

Take of Zedoary, in coarse powder,
Saffron, of each half a pound;
Distilled water, three pints.
Macerate for twenty-four hours; then press and strain. Reduce the strained liquor, by evaporation, to a pint and a half; to which add,

Compound powder of crabs claws, sixteen ounces;
Cinnamon,
Nutmegs, of each two ounces;
Cloves, one ounce;
Lesser cardamom seeds, half an ounce;
Double refined sugar, two pounds.
Reduce the aromatics together to a very fine powder, and form them into a confection, by adding the sugar.

Any of the foregoing compositions are sufficiently grateful, and moderately warm. They are given in doses of from five grains to a scruple, or upwards, either as a cordial, or as a vehicle for more active substances. The simple formula of the Edinburgh College serves all these purposes perfectly well.

AROMATICS, *(aromatica*, αρωματικα; from αρωμα, an *odour)*; a class of medicines which have a grateful spicy scent, and an agreeable pungent taste, as cinnamon, cardamoms, cloves, &c. See Aromatica.

AROMA'TICUS CORTEX; a name for the Canella alba.

AROMATI'TIS; a stone of a bituminous substance, in colour and smell, resembling myrrh. It is found in Arabia and Egypt.

A'ROPH, a contraction of *aroma philosophorum;* a name given to saffron. The *aroph Paracelsi* was a name given to a kind of chemical flowers, probably of the same nature with the ens veneris, prepared by sublimation from equal quantities of lapis hæmatitis and sal ammoniac. *Aroph* is also a term used frequently by *Paracelsus* in a sense synonimous with *lithrontriptic.*

ARQUEBUSA'DE, (from the French, *arquebuse, a hand-gun)*; so called because they used it as a vulnerary in gun-shot wounds. It is the name of a distilled water which has also had the different names of *aqua vulneraria*, *aqua sclopetaria*, and *aqua catapultarum.* It is mint, sage, mugwort, and a farrago of other vegetables, distilled in wine. The following directions for preparing it appear in a foreign Dispensatory:

Aqua Vulneraria. Phar. Argent.

Take of Comfrey, leaves and roots,
Sage,
Mugwort,
Bugloss, of each four handfuls;
Betony,
Sanicle,
Ox-eye daisy,
Common daisy,
Greater figwort,
Plantane,
Agrimony,
Vervain,
Wormwood,
Fennel, of each two handfuls;
St. John's wort,
Long birthwort,
Orpine,
Veronica,
Lesser centaury,
Milfoil,
Tobacco,
Mouse-ear,
Mint,
Hyssop, of each one handful;
Wine, twenty-four pounds.

"Having cut and bruised the herbs, pour on them the wine, and let them stand together in digestion, in horsedung, or any other equivalent heat, for three days. Afterwards distil in an alembic with a moderate fire."

This celebrated water has been for some time held in great esteem, in *contusions*, for *resolving coagulated blood*, *discussing the tumours* that *arise on fractures and dislocations*, for *preventing the progress of gangrenes*, and *cleansing and healing ulcers and wounds*, particularly *gun-shot wounds.* Mr. Lemery has been at the pains of writing a whole treatise on it; in which he considers each of the ingredients singly, and supposes the water to possess their united virtues. In this, however, he mistakes; for the virtues of most of the herbs, admitting them to be as great as he would have them, reside in such parts as are not capable of being elevated in this process.

ARRACK; a spirituous liquor distilled from rice, and drank, in the rice countries, as we do brandy in this island. See Arack.

ARRHOE'A, (αρροια, from α, neg. and ρεω, to flow); the stoppage of a flux: and by Hippocrates appropriated to the suppression of the menses.

ARROWHEAD; the *sagittaria sagittifolia* Linn. The roots are said to be esculent, but it must be in times of very great scarcity. See Sagittaria.

ARROW ROOT, *Indian arrow root.* See Maranta.

ARSENIAS, (from *arsenicum*, arsenic); an arseniate, or arsenical salt. See Arseniates.

ARSENIATES, are arsenical salts, or compounds of the arsenic acid with the different alkalis, earths, and metals: M. Fourcroy enumerates twenty-three different species in his Elements of Natural History and Chemistry. Mr. Macquer gives the following as the mode of preparing the *arseniate of potass:*

Mix well together equal quantities of nitrate of potass, and of pure arsenious acid; put them into a retort, and distil at first with a gentle heat, but afterwards with so strong a heat as to redden the bottom of the retort. In this process the nitric acid is partly decomposed, and passes over into the receiver in the state of nitrous acid. The arsenious acid is at the same time converted into arsenic acid, and combines with the potass. The product, which is arseniate of potass, is found in the bottom of the retort, which may be obtained in the form of crystals of a prismatic figure, by dissolving it in distilled water, filtering the solution through paper, evaporating and crystallizing.

Mr. Accum says, the arseniates of soda, ammonia, or magnesia, may be obtained, by saturating the carbonates with arsenic acid; that of lime, by pouring arsenic acid into lime-water. Arseniate of silver precipitates, if arsenic acid be dropped into a solution of nitrate of silver. In a like manner arseniate of mercury is produced. Water, holding in solution sulphurated hydrogen gas, precipitates the arseniates in the form of a yellow powder.

ARSENIC ACID, *(acidum arsenicum).* This acid is only to be obtained by a chemical process. It consists of arsenic fully oxigenated; and it exists in a solid form. Arsenic acid is procured by distilling six parts of nitric acid from one of the oxide of arsenic. It has also been proposed by Mr. Pelletier to decompose the nitrate of ammoniac by the oxide of arsenic. The residue in the retort is the arseniate of ammoniac, from which the alkali may be driven by a fire long kept up. The residue is a vitreous mass, strongly attracting humidity, and falling into deliquium. It is the pure arsenical acid. Mr. Pelletier has likewise decomposed the neutral arsenical salt, by mixing it with half a part of sulphuric acid, and urging the fire to such a degree as to ignite the vessels. The residue at the bottom of the retort is a white mass, which attracts humidity, and is the arsenic acid. A white powder is observable, which is found to be the sulphate of potass or of soda, accordingly as the arsenial salt has soda or potass for its basis. From the various processes made use of to form the arsenical acid, it is evident that this substance is nothing but the arsenical oxide, saturated with the oxigene which it takes from the various bodies digested upon it. The nitric acid, or the nitrates used for this purpose, are decomposed; the nitrous gas passes over very abundantly, and the oxigene remains mixed and united with the oxide of arsenic. This acid possesses the concrete form; but it soon attracts the humidity of the air, and becomes resolved into a fluid. It is fixed in the fire; but if it be heated in contact with a coaly substance, it is decomposed, and the oxide exhales in the form of fumes. It is reduced into arsenic, according to Mr. Pelletier, by passing hydrogenous gas through it.

At the temperature of 59 degrees of Fahrenheit's thermomoter, this acid requires only two-thirds of its weight of water to dissolve it; whereas one part of the oxide of arsenic requires twenty-four of water to dissolve it at the same temperature. This acid, when dissolved in water, may be again concentrated, and carried to the state of a transparent glass without any alteration; for it is not by this treatment deprived of its power of attracting humidity from the air. When it is in this state of concentration, it acts strongly on the crucible, and dissolves the alumine of it, as is evident from the experiments of Mr. Berthollet. The arsenical acid, saturated with ammoniac, and duly evaporated, forms a salt crystallized in rhomboides; which, when urged by heat, loses first its water of crystallization, then its alkali, and is resolved into a vitreous mass. Bergman observes, that barytes and magnesia have a stronger affinity with this acid than the alkalis, and that lime decomposes the neutral salts with base of alkali. See Arsenicum.

ARSENICAL CAUSTIC, a species of caustic, said to possess useful properties, independent of those of destroying morbid parts to which it is applied. It is prepared thus:

Arsenicum Antimoniatum. Pharm. Chir.

℞ Antimonii lævigati ℥ij.
Arsenici ℥j.

These ingredients, after being reduced to powder, are to be fluxed together in a crucible, and afterwards reduced to powder a second time for use.

This is the caustic so extensively employed, under the name of *arsenical caustic*, by the late Mr. Justamond, in his treatment of cancers. See Cancer.

ARSENICUM, arsenic, a semi-transparent crystalline concrete, well known as a poison.

This substance which, when pure, is called REGULUS of ARSENIC, is a metallic oxide of a glittering whiteness, and sometimes of a vitreous appearance; exciting an impression of an acrid taste on the tongue; volatile when exposed to fire, in which situation it rises in the form of a white fume, with a very evident smell of garlic. But although it be most commonly met with under this form, it may be reduced to the metallic state by treating it with oils, soaps, or charcoal, in closed vessels; a circumstance with which Becher seems to have been acquainted. In this case the arsenic which sublimes is of a brilliant grey colour, resembling steel, but it speedily becomes black in the air: it forms crystals, which Mr. De Lille considers as aluminiform octahedrons. Arsenic is sometimes found native; and it is met with in stalactites, or in protuberant depositions formed of layers more or less distinct and concentric, which are separable from each other like the coats of an onion, or the laminæ of shells, from which it has obtained the name of *Testaceous Arsenic.* In other instances the masses are formed of very small scales, which render the surface of the specimen sometimes granulated, and sometimes full of small cavities: it is then called *Scaly Arsenic.* Arsenic is also found in friable masses, possessing scarcely any consistence. In these various forms it is received from Bohemia, Hungary, Saxony, Saint Maria aux Mines, and other places. This semi-metal is volatilized by an heat of about 144 degrees of Reaumur. In order to set fire to it, a little must be thrown into a crucible strongly ignited, and then it exhibits a blue flame, and rises in the form of white oxide. If it be sublimed by a gentle heat, it crystallizes in trihedral pyramids or in octahedrons. It is not soluble in water. According to Brisson its specific gravity is 57633. In fracture it resembles steel, but easily tarnishes.

From the observations of Bergman it seems, that arsenic exists in the metallic state in its combinations with cobalt, in the testaceous cobalt ore, and with iron in *mispickle.* It unites by fusion with most of the metals; but those which are ductile before this addition, become brittle afterwards. Such as are of difficult fusion alone flow more easily by heat, with the addition of arsenic; but those which are very fusible become refractory by the same addition. The yellow or red metals become white with this alloy. This substance is often combined with metals in various ores, and is disengaged from them by calcination. If arsenic be sublimed by a strong fire in closed vessels, it becomes transparent like glass; but its surface is soon rendered opake again by exposure to the air. It is not rare to find arsenical glass in the arsenic of commerce; it is yellowish, and soon loses its transparency by exposure to the air. This glass is sometimes found native in the cobalt mines, and among volcanic products.

When exposed to fire in close vessels, it is volatilized by a moderate heat into a white crystalline powder, known by the name of *Flowers of Arsenic.* Eighty parts of distilled water, at the temperature of 59 degrees, are required to dissolve one part of the oxide of arsenic; but fifteen are sufficient at the boiling heat. One part of the arsenic is soluble in between seventy and eighty parts of alkohol at the boiling point. The oxide of arsenic partakes therefore of the properties of saline substances, and differs from the other metallic oxides in being perfectly soluble in water; and because the other metallic oxides are without smell, and fixed in the fire; and because those oxides do not contract any union with metals; but, on the contrary, it resembles the metallic oxides, in becoming converted into a metallic glass by a strong heat; and in forming an opake insoluble substance, possessing the metallic brilliancy when deprived of oxigene. The oxide of arsenic is capable of combining with sulphur; and the result is either ORPIMENT or REALGAR, according to the manner of operating. Most chemists have a notion that the realgar contains more sulphur than the orpiment; and they have prescribed different proportions to form these two substances. But it has been shown by Mr. Bucquet, that this difference of colour arises simply from the manner of applying the fire, nothing more being necessary to convert orpiment into realgar, than the exposing it to a strong heat. From the same mixture either of these products may be obtained, according to the manner of applying the heat.

Orpiment and realgar are found native in certain places, and they have been described by different mineralogists. Crystals of the latter have been found in Solfatara near Naples, and other places. Realgar is common in China, where it is made into vases, pagods, and other ornamented works; and it is often found in the waters of volcanos, in compressed hexahedral prisms, terminating in two tetrahedral summits. Orpiment is less scarce than the realgar. Lime and the alkalis decompose these two substances, and disengage the oxide of arsenic from them.

Both the acids and the alkalis exhibit interesting phenomena with arsenic. The sulpuric acid, when boiled on the oxide of arsenic, attacks and dissolves it; but this oxide is precipitated by cooling. If the whole of the acid be dissipated by a strong heat, the arsenical acid remains behind. The nitric acid, assisted by heat, dissolves the oxide of arsenic, and forms a deliquescent salt. The muriatic acid acts on arsenic very feebly, whether heated or cooled, as has been observed by Mr. Bayen and others.

In order to form the sublimed muriate of arsenic, or *butter of arsenic*, as it has been called, equal parts of orpiment and muriate of mercury are to be well mixed together. The mixture is distilled by a gentle heat; and the receiver is found to contain a blackish corrosive liquor, which forms the

sublimed muriate of arsenic. Mr. Sage has observed, that cinnabar comes over if the heat be increased. If pure potass be boiled on the oxide of arsenic, the alkali becomes brown, gradually thickens, and at last forms a hard brittle mass. This arsenical salt, which was discovered by Mr. Macquer, is deliquescent. It is soluble in water, which lets fall brown flocks. It is decomposed by fire, and the arsenic escapes. Acids deprive it of its alkali, &c. Soda exhibits phenomena nearly similar, with this oxide: and the above chemist has even affirmed, that he obtained this salt in crystals. Mr. Chaptal has found that ammoniac dissolves the oxide of arsenic by heat; and has several times obtained crystals of arsenic by spontaneous evaporation. He is even of opinion that the alkali is decomposed in these circumstances, and that the nitrogene is dissipated, while the hydrogene unites with the oxigene of the oxide, and forms water. The oxide of arsenic hastens the vitrification of all the earths; but the glasses into which it enters as a component part, have the property of becoming easily tarnished. If equal parts of nitre and oxide of arsenic be distilled in a retort, they afford a very red and almost incoercible nitric acid. Mr. Macquer carefully examined the residue in the retort after the distillation, and found that it was a salt soluble in water, capable of crystallization in tetrahedral prisms terminated by four-sided pyramids, unalterable in the air, and fusible by a moderate heat, but without becoming alkalized. He called it the *neutral arsenical salt;* and supposed that no acid could decompose it. Mr. Pelletier has, however, shown that the sulphuric acid, when distilled with it, disengages its acid. The arseniate of soda differs little from the arseniate of potass. Mr. Pelletier has obtained this salt crystallized in hexahedral prisms, terminated by planes perpendicular to their axes.

From these experiments Mr. Macquer had shown that arsenic answered the purpose of an acid in these combinations. There remained only one step therefore to be made, to prove that it was really changed into an acid in these several operations; and it is to the celebrated Scheele that we are indebted for this discovery. His fine experiments upon manganese naturally led him to it. He has given two processes to obtain this arsenical acid; the first is by means of the oxigenated muriatic acid, and the other by the nitric acid. These acids are distilled from the oxide of arsenic: the muriatic acid abandons its oxigene to the oxide of arsenic, and resumes the characters of the ordinary muriatic acid. The nitric acid is itself decomposed; and one of its principles is dissipated, while the other is fixed and combines with the arsenical oxide. See Arsenic Acid.

As this substance is one of the most virulent poisons, Dr. A. Duncan, in the "Edinburgh New Dispensatory," gives a full account of its properties. He says, it sublimes entirely when exposed to 283 degrees of Fahrenheit. If a plate of copper be be exposed to the fumes, it is whitened. Arsenious acid is soluble in eighty parts of water at 60°, and in fifteen at 212°. This solution has an acrid taste, and reddens vegetable blues. It is also soluble in eighty parts of boiling alkohol. From either solution it may be obtained regularly chrystallized in tetrahedrons. From its solutions a grass-green precipitate is separated by a solution of sulphate of iron, a white precipitate by lime-water, and a yellow precipitate by any of the combinations of an alkali with sulphur, or with sulphur and hydrogen. All these precipitates, when exposed to a sufficient degree of heat, sublime, and emit the garlic smell, as we have already observed.

When treated with nitric acid, the *arsenious acid* is converted into *arsenic acid.* (See those articles). But the surest *test of the presence of arsenic*, is its reduction by carbonaceous substances. With this view, any suspected substance may be mixed with some fat or oily matter, introduced within a tube closed at the bottom, and exposed to a red heat. If arsenic be present in any state, it will then be sublimed in brilliant metallic scales.

Arsenious acid is used in various ways: by the dyers, as a flux in glass-making, in docimastic works, and in the common yellow and other glazes. Arsenious sulphurets are much used by painters, but these advantages to the community are not able to compensate for its bad effects on individuals. In mines, it causes the destruction of those who explore them. Being very volatile, it forms a dust, which destroys the lungs; and the unhappy miners, after a languishing life of a very few years, all perish sooner or later. The property which it possesses of being soluble in water, increases and facilitates its destructive power; and it ought to be proscribed as an article of commerce, by the strict law which prohibits the sale of poisons to unknown persons. Arsenic is every day the instrument by which victims are sacrificed, either by the hand of wickedness or imprudence. It is often mistaken for sugar, and for other substances to which it bears an apparent resemblance; and these mistakes are attended with the most dreadful consequences. The symptoms which characterize this poison are a great constriction of the throat, the teeth set on edge, and the mouth strongly heated. There is an involuntary spitting, with extreme pains in the stomach, vomiting of a glairy and bloody matter, with cold sweats and convulsions, which soon prove fatal.

On dissection, the stomach and bowels are found to be inflamed, or gangrenous, and the blood is

fluid. Soon after death, livid spots appear on the surface of the body, the nails become blue, and often fall off along with the hair, the epidermis separates, and the whole body becomes very speedily putrid. When the quantity is so very small as not to prove at once fatal, tremors, palsy, and lingering hectics succeed, and in the end occasion death.

Instead of the mucilaginous and oily drinks, usually given to persons poisoned by arsenic, M. Navier has proposed a more direct counterpoison. He prescribes one drachm of sulphuret of potass to be dissolved in a pint of water, which the patient is directed to drink at several draughts: the sulphur unites to the arsenic, destroys its causticity and thus tends to prevent its fatal effects. When the first symptoms are alleviated, he advises the use of sulphureous mineral waters. He likewise approves of the use of milk, but condemns oils. Vinegar, which dissolves arsenic, has been recommended by M. Sage, but upon what grounds we know not, as a solution would render it more diffusible, without taking from its active qualities. According to Arneman, a solution of soap is the best remedy. One pound of soap, he says, may be dissolved in four pounds of water, and a cupful of this solution drunk lukewarm every three or four minutes; but if soap is to be trusted in such a case, a solution of potass would be more likely to prove effectual, as it actually does in some other poisons. See Poisons.

The arsenious acid has been occasionally employed in the cure of diseases, both externally and internally. Externally it has been chiefly employed in cases of cancer. See Cancer. The late Mr. Justamond used an ointment composed of four grains of white oxide of arsenic, ten grains of opium, and a drachm of wax cerate, and spread very thin upon linen. But its action is tedious. He also fumigated cancerous sores with sulphuret of arsenic, with a view to destroy their intolerable fetor, and with a degree of success. Le Febure washed cancerous sores frequently, in the course of the day, with a solution of four grains of arsenious acid in two pounds of water. Arneman recommends an ointment of one drachm of arsenious acid, the same quantity of sulphur, an ounce of distilled vinegar, and an ounce of ointment of white oxide of lead, in cancerous and ill-conditioned sores, and in suppurated scrofulous glands. The arsenious acid has even been applied in substance, sprinkled upon the ulcer. But this mode of using it is excessively painful, and extremely dangerous. There have been even fatal effects produced from its absorption into the constitution.

In order to employ them with safety, the principal thing to be attended to, in arsenical applications, is to diminish their activity. They then cause little irritation or pain, but rather excite a gentle degree of inflammation, which causes the diseased parts to slough off; they have too the peculiar advantage of not extending their operation literally. See Arsenical Caustic. It may justly perhaps be said, that no other escharotic possesses equal powers in cancerous affections; but unfortunately its good effects often do not go beyond a certain length, and if in some cases it effects a cure, in others it must be allowed it does harm, by the inflammation it excites. While it has occasioned very considerable pain, it has given the parts no disposition to heal, the progress of the ulceration becoming even more rapid than before, in various instances.

Arsenical preparations have been used internally, in the form,

1. Of *arsenious acid* dissolved in distilled water, in the proportion of four grains to a pint. A table spoonful of this solution, with an equal quantity of milk, and a little syrup of poppies, is directed to be taken every morning fasting, and the frequency of the dose gradually increased till six table spoonfuls are taken daily. This is according to M. Le Febure's method of curing cancerous affections.

2. Of the *arsenite of potass*, the form of exhibition is this: sixty-four grains of arsenious acid, with an equal quantity of carbonate of potass, are to be boiled together until the arsenious acid be dissolved, when as much water is to be added as will increase the solution to one pound. Of this, from two to twelve drops may be given once, twice, or oftener, in the course of a day. This is Dr. Fowler's method of curing agues.

3. The arsenious acid itself, to the extent of an eighth of a grain for a dose, combined with the flowers of sulphur, has been said to be employed internally in some very obstinate cutaneous diseases, and with the best effect.

But notwithstanding the apparent success which is said to have attended the exhibition of arsenic by Dr. Fowler, and other eminent men, and notwithstanding its frequent use, even as a domestic remedy, in the fenny parts of England, and other countries, for the cure of intermittent fevers, it is fairly to be suspected of undermining the constitution, and of laying the foundation for mortal diseases. Hence its general use ought to be rigorously discouraged. The French directory were, however, of a different opinion, when they published an edict, *ordering* the surgeons of the Italian army to free the numberless soldiers, who were seized with agues in the marshes of Lombardy, of their complaints, in the course of two or three days, and at the expence of as many sous, under the pains of military punishment.

ARSENICUM TARTARISATUM, tartarised arsenic, a form in which arsenic has been exhibited by some practitioners in London. It is prepared thus:

Arsenicum Tartarisatum. Pharm. Chir.

℞ Arsenici albi,
Crystallorum tartari, sing. ℥ ij.
Aquæ distillatæ lb. j.

Boil these together for half an hour, and afterwards filter the liquor, which is then to be evaporated and the residue set aside to crystallize.

This is the arsenical preparation recommended by Mr. Sherwen, a practitioner near London; and of which an account is given in Vol. II. of Memoirs of the Medical Society of London. It is fully liable to all the objections brought against the other preparatious of this dangerous mineral. See Arsenic.

ART, as defined by Lord Bacon, is a proper disposal of the things of nature by human thought and experience, so as to answer the several purposes of mankind; in which sense, *art* stands opposed to *nature*. Art is principally used for a system of rules serving to facilitate the performance of certain actions; in which sense it stands opposed to *science*, or a system of speculative principles.

Arts are commonly divided into *useful* or *mechanic*, and *liberal* or *polite*. The former are those wherein the *hand* and *body* are more concerned than the mind; of which kind are most of those which furnish us with the *necessaries* of life, and are properly known by the name of *trades*; as baking, brewing, carpentry, smithery, weaving, &c. The latter are such as depend more on the labour of the mind than that of the hand; they are the produce of the *imagination*, their essence consists in *expression*, and their end is *pleasure*. Of this kind are poetry, painting, music, &c. Medicine, surgery, and obstetrics, are also called *arts*, though not strictly conformable to either of the foregoing definitions. They are, in fact, sciences; though, in their practical application, they are, at the same time, to be considered as arts; especially the two last, in which manual dexterity is no less essential than theory.

ARTEMISIA, (αρ7εμισια, so called, according to some, from Artemisia, wife of Mausolus king of Caria, who brought this plaut into use; or from αρ7εμις, *Diana*, that goddess being said to have given name to it); *mugwort*, a genus of the *polygamia superflua* order, belonging to the *syngenesia* class of plants. Of this genus there are upwards of twenty species enumerated by botanical writers; but those most worthy of notice are the following:—

1. The Vulgaris, or *common mugwort*. This grows naturally on banks and by the side of footpaths in many parts of Britain, so is seldom admitted into gardens, where it would prove a troublesome weed, as it spreads very fast by its creeping roots. It flowers in June, at which time the plant is ready for medical use.

2. The dracunculus, or *tarragon*, which is frequently used in sallads, especially by the French. It is a very hardy plant, and spreads greatly by its creeping roots.

3. The abrotanum, or *southernwood*, which is kept in gardens for the sake of its agreeable scent. It is a low shrub, seldom rising more than three or four feet high, sending out lateral shrubby branches, growing erect, garnished with five bristly leaves, having an agreeable scent when bruised: the flowers are produced in spikes from the extremity of the branches; but unless the autumn is warm, they seldom open in England.

4. The santonicum, or *judaicum*, which produces tha *semen santonicum*, a remedy much used for destroying worms in children. It grows naturally in Persia, from whence the seeds are brought to Europe. It has the appearance of our wild mugwort; the branches are slender, erect, and garnished with linear winged leaves, and terminated by recurved slender spikes of flowers which have naked receptacles.

5. The artimisia maritima, or *sea-wormwood*, grows naturally on the sea-coasts in most parts of Britain, where there are several varieties, if not distinct species, to be found. These are low undershrubs, most of which creep at the root, by which they multiply greatly in their natural situation, but when transplanted into gardens seldom thrive so well.

6. The pontica, or pontic wormwood, commonly called *Roman wormwood*, is a low herbaceous plant, whose stalks die in autumn, and new ones appear in the spring. These are garnished with finely divided leaves, whose under-sides are woolly; and the upper part of the stalks are furnished with globular flowers which nod on one side, having naked receptacles. These appear in August, but are rarely succeeded by seeds in Britain.

7. The absinthium, or *common wormwood*, grows naturally in uncultivated places. See Absinthium.

8. The arborescens, or *tree wormwood*, grows naturally in Italy, and the Levant, near the sea.—It rises with a woody stalk, six or seven feet high, sending out many ligneous branches, garnished with leaves somewhat like those of the common wormwood, but more finely divided, and much whiter. The branches are terminated by spikes of globular flowers in the autumn, which are seldom succeeded by seeds in this country.

The southernwood is propagated by slips or cuttings planted in a shady border about the beginning of April, observing to water them in dry weather. In this border they may remain till the following autumn, when they should be transplanted, either into pots, or those parts of the garden where they are to remain. The santonicum is likewise propa-

gated by slips; but the plants should be placed in a dry soil, and sheltered situation, where they will endure the cold of our ordinary winter pretty well; but it will be proper to have a plant or two in pots, which may be sheltered under a common hot bed frame in winter, to preserve the species.—The true wormwood is easily propagated in the same manner. The cuttings must be planted in a shady border, and duly watered during the summer season, in which case they will take root freely.—In autumn some of the young plants should be potted, that they may be sheltered in winter; the others may be planted in a warm border, where they will live, provided the winter proves favourable. The other sorts spread by their creeping roots; and require no culture, as they are very hardy, and will thrive any where.

The *medical uses* of the different species of Artemisia are many. The MOXA, so famous in the eastern countries for curing the gout by burning it on the part affected, is the lanugo, or down, growing on the under side of the leaves of a species of mugwort, supposed to be the same as our common sort. From some dried samples of this plant, which have been sent over to this country, Mr. Miller reckons them to be the same, differing only in size; in which the East Indian kind is inferior to ours. He supposes that the lanugo of our mugwort would be equally efficacious. The seeds of the santonicum are small, light, chaffy, composed as it were of a number of thin membranous coats, of a yellowish colour, an unpleasant smell, and a very bitter taste. These seeds are celebrated for anthelmintic virtues (which, however, they have only in common with other bitters), and are some times taken with this intention, either along with melasses, or candied with sugar. They are not very often met with genuine in the shops. The leaves of the sea, common, and Roman wormwoods are used as stomachics, but are all very disagreeble: the Roman is the least so, and therefore is to be preferred; but the other two kinds are generally substituted in its place. The distilled oil of wormwood is sometimes made use of, by the nurses, to rub the bellies of infants as a cure for worms.

ARTEMISIA ABROTANUM; the systematic name for the *abrotanum* of the pharmacopœias. See ARTEMISIA and ABROTANUM.

ARTEMISIA ABSINTHIUM; the systematic name for the *absinthium vulgare* of the pharmacopœias. See ABSINTHIUM VULGARE.

ARTEMISIA JUDAICA; the systematic name for the *Santonicum* of the pharmacopœias. See ARTEMISIA and SANTONICUM.

ARTEMISIA MARITIMA; the systematic name for the *absinthium maritimum* of the pharmacopœias. See ARTEMISIA and ABSINTHIUM MARITIMUM.

ARTIMISIA PONTICA; the systematic name for the *absinthium ponticum*. See ARTEMISIA and ABSINTHIUM VULGARE.

ARTEMISIA RUPESTRIS; the systematic name for the *genepi album* of the pharmacopœias. See GENEPI ALBUM.

ARTEMISIA VULGARIS, MUGWORT. This plant is the *Artemisia, foliis pinnatifidis planis incisis subtus tomentosus, racemis simplicimis recurvatis floribus radio quinquefloro* Linn. It is slightly bitter, and although in great esteem in former times, is now little used. From the dried tops of this plant, the Japanese prepare a soft substance, which they call moxa. See ARTEMISIA and MOXA.

ARTERIA, (αρτηρια, from αηρ, *air*, and τηρεω, *to keep)* an ARTERY; so called because the ancients supposed that *air* only was contained in arteries. But by the word *artery* Hippocrates meant what is now known by the name of *asperia arteria*, or *trachea;* nor were the veins distinguished formerly from the *arteries;* for φλεψ, amongst the ancients, was applied both to arteries and veins; and indeed, some writers after them have used the term *vena*, when speaking of the pulse.

Arteries are long extended cones, whose diameters decrease as they divide into more numerous branches: yet where they run for some length, without giving off large branches, their convergency, if any, is not very evident. At their extremities they are cylindrical, or very imperceptibly diminished, and are called CAPILLARIES, which admit only of a single globule of blood at once, and whose tranverse section is always circular. Where the arteries send off large branches, the cavity is there suddenly diminished, insomuch that the arteries might be taken for a chain of cylinders, of which every one is narrower than the preceding. If we consider them to be cones, then the common basis of the cone in all arteries is either in the one or the other ventricle of the heart; and the apex of the cone terminates either in the beginning of the veins, or in the beginning of the cylindrical part of the artery, or in the exhaling vessel, unless it be cylindrical. In some places they seem to diverge or dilate; at least they become of a large diameter, after they have been filled or distended with wax; which possibly may arise from some stoppage of the wax, by whose impulse that part of the length of the artery becomes more distended than the rest. Examples of this kind we have in the basilar artery at the basis of the skull; in the splenic artery, in the flexure of the carotid artery, according to Cooper; in the humeral artery near its division; and, lastly, unless these experiments deceive us, in the spermatic arteries.

These vessels have no external proper coat universally extended over them, but the office of such a coat is supplied to some of them by one single incumbent integument, which, in the thorax, is the pleura, and in the abdomen, the peritonæum. In

the neck, arm, and thigh, a sort of thicker cellular substance surrounds the arteries. The membrane of the pericardium, which on all sides surrounds the aorta, returns back with the vessels to the heart. The dura mater imparts a capsule, that surrounds the carotid artery as it passes out through a hole in the skull. But the first true external membrane common to the arterial tube in all parts of the body, is the cellular substance, which in some parts (as in the thorax) we see replenished with adipose substance.

This cellular coat, in its external surface, is of a more lax texture, abounding with small arteries and veins; and it has nerves running through its substance, which are none of the smallest. There is sometimes so much of this cellular substance about the artery, as might occasion us to think it hardly belonged to the vessel as an external coat or lamella, but rather as some foreign net-work added to it. Thus we find it in the arteries of the neck, groins, and subclavians; in the mesenteric, cœliac, and hepatic arteries; where it is chiefly interwoven with long fibres. These are the vaginæ or capsules of the arteries, formerly observed by some eminent anatomists, and which, according to Wrisberg, are best seen in young animals, or in such as have laboured under a congestion or suffocation.

As this cellular coat passes deeper, it becomes more dense, solid, and of the consistence of felt, and may be called the *proper coat* of the artery. That there is no tendinous coat of the arteries distinct from this last part of the cellular substance, is evident from maceration, whereby the inner stratum of this arterious tunic changes into a cellular substance, which may be divided into layers.

There is found within the former, a coat consisting of muscular fibres, which are, in general, imperfect circles: that is to say, no fibre any where makes a complete circle round the vessel; but a number of segments conjoined together, with their extremities turned off sideways, seem to form one ring round the artery. These fibres, in the larger arterial trunks, form many strata, appear of a reddish colour, and are remarkably firm and solid; but in the smaller arteries they are by degrees more difficult to demonstrate; and they seem to be wanting in the arteries of small animals. Haller had never observed them to run along the vessel lengthwise. Under these membranes, but rather difficult to demonstrate, is an exceeding short cellular texture, into which a chalky concreting matter is poured when an artery offifies.

The *innermost coat* of the artery is thin, and finely polished by the current of the blood. It forms a continued incrustation that every where lines the fleshy fibres, which are not very continuous one to the other, and prevents the blood from insinuating itself into the spaces between them. It is every where smooth and without valves; although in some places there are peculiar eminences that form a kind of folds; these folds, at the origin of branches are, by a mechanical necessity, formed into semicircles, especially in the larger branches, those, for instance, which come from the arch of the aorta. Yet, in arteries of the viscera, the innermost coat, is soft, lax, wrinkled, and almost friable, especially in the *ductus arteriosus.*

To the arteries themselves also belong arteries. These are more particularly spread through their external cellular coat, and spring out on all sides from the next adjacent small arterial trunks. They are numerous, branchy, and like net-work; they are very minute, but plainly appear, even in the fœtus, without injection. Nerves also descend, for a long way together, through the surface of the artery, and at last vanish in the cellular substance of the vessel; of which we have a specimen in the external and internal carotids and in the arch of the aorta; and Waller has shewn them in several arteries of the thorax and abdomen. Do not the arteries seem to derive from these nerves a muscular and convulsive force, very different from that of their simple elasticity? Does not this force shew itself plainly enough in fevers, faintings, palsies accompanied with atrophy, and passions of the mind? Haller considers the artery as being in a manner insensible and inirritable; and if it be constricted by the application of poisons, he says it has every property of the dead skin. This, however, is not agreeable to the opinions of physiologists of the present day; nay, it is certainly unfounded.

In viewing the *sections* of arteries we find them circular, because the vessels are elastic; and this is the reason why, from the small arteries of the teeth, hemorrhagies have sometimes proved fatal. The aorta, indeed, the carotids of the neck, and some other arteries of the dead body, from their lessened extension, appear somewhat flat or depressed; but their round figure, or circular section, is every where restored by injection. *Their elasticity* is also evident by that powerful compressure, which a segment of a large artery makes upon the finger that distends it, and which is much stronger in a dead than in a living body. In the living body, indeed, this force yields to that of the heart; but instantly recovers itself when the heart is relaxed, and restores the artery to its former diameter; and this makes the *pulse*, which all arteries possess, although the systole and diastole can be perceived by the finger, only in the larger, not in the smaller ones: in the ultimate inflection of the arteries, the pulse totally vanishes; but, by an increased motion of the blood, even the lesser arteries make a violent pulsation, as we see in an inflammation, or in pressure depending on an internal cause. On dissection, these vessels strongly contract lengthwise, and are diminished in length.

The arteries are of considerable strength; but as

the dense hard net-work of the outer cellular coat refuses to yield to a distending force, it breaks without much difficulty, and almost easier than the coats of the veins: and hence it happens that aneurisms arise. But, in general, the trunks are, in all parts of the body, weaker, and the branches stronger in their coats; whence the impulse of the blood may exert a considerable effect upon the former, but least of all on the arteries of the limbs. Hence it is, that aneurisms are most frequently formed near the heart; for, in the lower extremities, and in the secreting organs, the strength of the arteries, and of the veins too, is much augmented.

Nature has dispersed the arteries through the whole animal body, except in a few membranes where they have not yet been observed. She has disposed the trunks, every where, in places of safety; because, as wounds in the smaller trunks are always so dangerous, so in the larger they are very frequently mortal. The skin is spread with numerous short and small arterial branches; but the larger trunks, defended by the skin and muscles, creep along near the bones. In general, the arteries are in proportion to the parts of the body to which they are sent. The largest go to the secretory organs, the brain, spleen, &c. the lesser ones enter the muscular parts.

The proportion which the cavity of an artery bears to its solid part is not every where the same, nor is it constant even in the same vessel. This proportion, in the first place, is least of all at the heart, and increases as the arteries remove farther from it. Secondly, in a full-fed plethoric animal, whose blood passes freely, and with great force through its arteries, the proportion of the solid parts of these vessels is less than in a famished extenuated animal, whose blood circulates feebly.

Branches proceed from the trunks of all the arteries, and these are again subdivided almost infinitely. The sections of any two branches taken together, exceed that of the trunk from whence they proceed, in the proportion of three to two, or somewhat less. Every trunk just above its division is somewhat broader, or more expanded, than at a little distance from the division. The angles at which the branches go out from their trunks, are generally acute, either half right angles, or nearly so; which, as we learn from mechanics, is the angle in which projectiles are carried to the greatest distance. We have instances of their going off at right angles, or nearly so, in the lumbar or intercostal arteries; of their going off in a retrograde or reflected course, we have one instance in the coronaries of the heart, and another in the spinal arteries, which are produced by the vertebral. But, generally speaking, those which are esteemed retrograde or reflected, were sent off, at their origin, in acute angles; such as the ascending artery of the pharynx, the descending one of the palate, the umbilical mammary arteries, and the nutritious arteries of the large bones. Lastly, we often observe large branches arising at a less angle, and smaller ones at a greater angle. We rarely observe two arteries of a large diameter run together into one trunk. An example of this, however, we have in the artery formed by the junction of the vertebrals. In the smaller ones it is frequent; as in both the spinal arteries, and that of the sincipital foramen. The arteries often have serpentine flexures, especially those that are distributed on parts subject to much motion, or to an increase of size, as the arteries of the large intestines, womb, face, spleen, lips, and iris. Arteries that are rectilineal in a natural state, become serpentine if they are much distended. Arteries are sometimes twisted or writhed, as the carotids under the mamillary process are found to be.

Arteries are occasionally connected by intermediate branches, by a twig of some particular artery meeting one of the same kind from another neighbouring artery; and by joining, they, together, form one trunk. Instances of this kind we have among the large trunks in the intestines, among the middling ones in the kidneys, womb, &c. and among the smaller in all parts of the body; insomuch that there is no part of the human body, wherein the neighbouring arterial trunks, whether of the same or of different denominations, do not form anastomoses, or joinings one into another, by intermediate branches. Of rings, diverging laterally from the arteries and returning into themselves, we have instances in the eye and brain. The extremities of the arteries, which are either cylindrical or nearly so, send off smaller branches in greater abundance than the large arteries do, and these extremely small ramifications, anastomosing with one another form a kind of net-work; as we see more particularly in all membranes. By this means, were the passage from the heart to any part of an artery to be obstructed, the blood will nevertheless flow through the arteries which are near the obstructed spot. Thus a gangrene, or other effects of languor of the circulation through a part, is prevented; and it is possible, the obstruction may be resolved by the repulsion of the obstacle into the larger part of the trunk.

Lastly, it happens, that one of the least arteries is either changed by a continuation of its canal into a vein, in such a manner, that the ultimate little artery, which is generally reflected, having passed the angle of its reflection, becomes now a small vein; or else a branch, sent out at right angles from the artery, is inserted by a like angle into the branch of a small vein. Both these kinds of mechanism are demonstrated to us by the microscope, and the easy return of injections through the veins into the arteries. We sometimes see these vessels

large enough to receive only one, and sometimes several blood globules at a time. A large artery, however, never opens into a vein.

In the viscera, the small arteries are not disposed so much in net-work as in a fabric of a peculiar kind, wherein the small branches descend very thickly, or in clusters parallel to the trunk, so as to resemble brushes, or a variety of little trees or bushes, small serpents, or threads, according to the various disposition of the parts on which they are situated.

But it happens sometimes that arteries end in another manner, namely, by being converted into vessels of the smaller kinds, which are continuous to the arteries, and are indeed real arterial trunks; as may be seen in the ophthalmic artery, by tracing the arteries of the tunica choroides, or the colourless ones of the circle of the uvea and iris. That a net-work of pellucid arteries is continuous with the red branches of the ophthalmic artery, is evident from inflammations, and the redness of the parts when relaxed by vapour or by cupping; from repletion, and from various microscopical experiments made by Lieberkuhn upon frogs, in which colourless globules were seen to pass from a red artery into a lateral vessel. In a fabric of this kind, the red blood is easily forced into the smaller trunks.

In other places we see the smaller vessels proceeding laterally, as branches from the trunks of the least sanguineous arteries; and these again are extended into trunks still smaller, called *excretory ducts*. It is with difficulty that these vessels will admit red blood: of this, however, we have examples in the kidneys, the liver, and the breasts. Indeed the blood, when vitiated, penetrates the excretory ducts of the whole body, even without hurting the vessels; nor is that aberration found to be productive of any bad consequence after the disorder which occasioned the phenomenon is cured.

Another mode of termination of the arterial extremities is into the exhaling vessels; and this manner of their ending is very frequent in all parts of the body. The whole skin, all membranes of the human body which form any close cavity, all the ventricles of the brain, the anterior and posterior chambers of the eye, all the adipose cells and pulmonary vesicles, the whole cavity of the stomach and intestinal tube, and the trachea, are all of them replenished with exhaling arteries of this kind. These emit a thin, watery, gelatinous humour, which, by congestion, stagnation, or excess, is converted into a watery but coagulable lymph, as we see in several diseases, and in death. The exhalants are easily demonstrable from the watery sweat that ensues after injecting the arteries with any warm liquor. In some places, they exhale indeed not a thin vapour, but blood itself, as we see in the heart, the cellular fabric of the penis, urethra, clitoris, and nipple of the female breast; in all which, blood, in its natural, state is emitted. "Does not," says Mr. Fyffe, "every secretion, that is made in true glands, or hollow cryptæ, bear some analogy to this exhaling fabric?

"Whether or no, in all parts of the human body, do the pellucid vessels, arising from the sanguine ones, and carrying a humour thinner than blood, again send out smaller vessels, to be subdivided into still smaller orders? We seem, indeed, not to want examples of this circumstance. Several anatomists have seen, in various parts of the body, a new rise of blood-vessels, after the course of the blood to the heart had been obstructed. That an aqueous vapour is secreted by very fine vessels, from the colourless arteries of the iris, is very probable. We are almost certain that the red coloured vessels in the cortical substance of the brain, separate a juice pervading the medullary substance, by the intermedium of another order of vessels; and that an erysipelas, or yellow inflammation, arises from the impaction of yellow globules into the smaller vessels.

"It may then be asked, if there are not yellow arterious vessels of a second order, which send off lymphatic ones of a third order, from whence by degrees still lesser kinds of vessels branch out? Such a fabric does not seem agreeable to the very easy transition that is made by the blood, mercury, or wax, into the exhaling and perspiratory vessels, into the uriniferous tubuli, and into the adipose and pulmonary cells; nor is it very difficult for the blood to stray into the lactiferous, lymphatic, and lachrymal ducts, whither it should seem not able to penetrate, if it had to make its way through any other intermediate vascular system smaller than the blood globules. Nor can this opinion be admitted, on account of the great retardation to which the humours in a third order of vessels would be liable, and which would continually increase in proportion to the smallness of the vessels."

In speaking of the common offices of the arteries, the same writer observes, that the blood which is driven from the left ventricle of the heart in a serpentine stream, into the aorta, strikes first against the right side, and then the left side of that great vessel; and from thence flows with repeated illisions and repercussions through the whole arterial system of the human body.

The arteries, in a living person, it is evident, are always full of blood; since the jet from an artery, is not interrupted by alternate stops, while the heart is inactive, but flows on in a continued thread. The microscope also shews the arteries, in living animals, to be full, both in their systole and diastole; nor can the circular fibres of the arteries so far contract themselves as entirely to evacuate these

tubes. Every contraction of the ventricle sends a new wave of blood into the arteries; this wave seldom exceeds two ounces, and consequently bears only a small proportion to the whole circulating mass; yet it is so forcibly propelled by the heart as to drive the preceding waves before it. In consequence of this propulsion, the dimensions of the cylindrical artery are augmented, the arterial coats are pressed near each other, and the serpentine flexures are considerably increased, as we often see in injections. This dilatation of the artery, whereby its capacity is changed from a less to a greater circle, is called the *pulse*, the diastole of which is an expansion of the artery beyond its natural diameter. This action is the characteristic of life; resulting from the heart *only*, and in no wise natural to the arteries themselves. Hence, when the motion of the heart is intercepted, whether by aneurism, ligature, or otherwise, pulsation of the arteries is not to be felt; and hence a sudden cessation of the pulse, by a wound through the heart. The artery is proportionally more dilated, the more the velocity of the new wave, or push of blood, exceeds that of the preceding one.

To the systole, or contraction, of the artery succeeds its dilatation. For the heart having emptied itself, and removed the stimulus of the blood, comes into a quiescent state. But the artery, at this same time, by its innate elasticity, and by the contractile power residing in its circular fibres, irritated likewise by the stimulus of the blood, contracts itself, and expels as much blood as served to dilate it beyond its mean or natural diameter: this quantity of blood is either forced into the smaller and scarce beating arteriolæ, or into the veins, as the semilunar valves of the aorta oppose the return of the blood. As soon as the artery has freed itself from this wave or column of blood, being no longer stimulated by distention, it directly collapses by its own proper contractile force, and is now again ready to yield to a new wave or column of blood sent into it from the heart; whence follows a repeated diastole and systole.

That the arteries thus contract, and, by that force, propel their constrained blood, is evident from their strongly contractile and elastic nature; from the evident remission of the dilatation they receive from the heart; from the evacuation of the blood contained between two ligatures, through the lateral branches; from the return of the blood to the heart through veins when the artery going to these veins is tied; from the wave of blood being greatest when the heart is in its diastole, as has been well observed by some eminent anatomists; from the strength with which the blood is ejected below a ligature on the aorta; and lastly, from the evacuation which the arteries make of their contained blood, even after death, into the veins, whereby these latter appear much fuller.

The blood's velocity in the arteries is diminished during the heart's systole, but increased during its diastole: physiologists suppose it, at a medium, to be somewhat less than one foot in a second of time. The constant plenitude of the arteries renders it impossible for us to perceive any succession in the pulses of different arteries; whence all the arteries of the body seem to beat at one and the same instant, whilst the heart strikes against the breast: and yet, Mr. Fyffe asserts, that there is certainly a succession in the systole of the arteries, by which the aorta seems to contract successively, as it is filled with blood expelled from the heart; so that he conceives that part of the artery next the heart to be first constringed, and that thence the arterial contracting force gradually proceeds to the extremities. We have, he says, an instance of this in the intestines; and very evidently in insects, that have a long fistulous and knotted heart, manifestly contracting in a succession from the beginning to the end. In the human arteries, however, the successions are so quick as to be imperceptible to the nicest examination.

"The pulse is continued to, and ends in, the expillary and cylindrical arteries, or the originations of the veins. We have already mentioned the velocity with which the blood comes from the heart; but that velocity continually decreases. The transverse sections of all the arteries at a distance from the heart, are in one sum greater than the section of the aorta; and the aggregate area of their sections increases, but in an uncertain proportion, as the distance from the heart increases: the velocity will consequently decrease as the distance increases, for it must always be inversely proportional to the area of the tube through which the fluid runs. Again, the thickness of the coats of arteries increases, as their bores decrease; and is largest in the least of them, which transmit only one globule at a time. The truth of this is proved from anatomy; and from the greater difficulty we find in bursting small than large arteries, by inflating them. Another cause of the decrease of the blood's velocity, is the friction of the globules against the sides of the vessel; and this friction will be very considerably increased by the length of the arteries, by their ramification, by their winding direction, and also by their diminished diameter and conical form. Moreover, the inflections and folds of the vessels greatly slacken the blood's motion; since always some part of the impelling force is spent and lost in removing the convex part of the folds, and changing the figure of the inflected vessel. The angles also, formed by the lateral branches, greatly diminish the blood's motion; and that in proportion to the size of the angle. A considerable allowance must be made for the great viscidity or tenacity of the blood, which entirely coagulates by rest; its circulatory motion

alone overcomes the mutual attraction of its parts, and prevents it from adhering to the sides of the vessels in a coagulated state, as we see in aneurisms and wounds of the arteries, and after death. The opposition which the blood meets with in the branches lessens its velocity in the trunk: and the opposition of torrents of blood to one another in the anastomoses of vessels also destroys some parts of its motion. We may easily perceive the amount of this retardation will be very considerable, although it be difficult to estimate it justly. In the larger trunks the blood of a living animal flows with the rapidity of a torrent: but, in the least branches, it creeps along very slowly, and begins to coagulate. It is also well known to surgeons, that a small branch of an artery near the heart bleeds more dangerously than a much larger one at a greater distance. The weight of the incumbent atmosphere, of the muscles and fleshy parts lying above the artery, and the contractile power of the vessel itself, also make a resistance to the heart; but they do not lessen the velocity of the blood, for they add as much in the diastole as they diminish in the systole.

"It is certain, however, from incisions made in living animals, that the single globules of blood, which move separately in the small vessels, do not lose so much of their velocity as, by calculation, they ought to do. We must therefore assign some causes which lessen the decrease of the blood's velocity. In the first place, the great area of all the small branches compared with the area of the trunk, and the excessive smoothness of the inner coats of the vessels, both contribute to diminish the friction. The facility likewise with which the blood flows through the veins, expedites its passage through the little arteries, immediately communicating with these veins. No great assistance toward ascertaining these particulars is to be expected from considering the effect of ligatures, or the weight of the blood; the latter is capable both of diminishing and accelerating the motion; nor can we suppose that in living animals a great effect depends upon the former. The power of derivation, whatever that is, and the motion of the muscles, are capable of producing a new velocity."

From what has been said, we are naturally led to the phenomena of the pulse and its indications of particular states of the vascular system: this important subject however, will be considered under the article PULSE.

The blood is passed very slowly through the least veins, partly by the force of the heart, and partly by the contractile force of the arteries. A renewal of the circulation in persons drowned, where, merely by exciting the action of the heart, the whole mass is again propelled, is a proof of the former; and the contractile force of the artery is proved by what has been said above.

The motion of the blood is quicker in the larger veins. For whenever the impelling powers remain sufficient, and the small vessels are rendered narrower, the motion of their contained fluids must of course be accelerated; since the section of the venal trunk is much less than that of all its branches, in the same manner as that of an artery is less than the sum of the branches into which it divides.

Since the blood moves thus slowly in the least arterial vessels and incipient veins, and as the weight of the blood itself in many places greatly hinders its return to the heart, while, at the same time, the very thin coats of the veins have but little contractile power; nature has therefore used various precautions, lest, from the slowness of its motion, it should any where stagnate or concrete. To obviate this, she has supplied the veins with more watery vapours and fluxile lymph than the arteries; and this was the more necessary, in order to counterbalance the great exhalation that is made from the arterial blood in the pulmonary vessels.

She has likewise placed the veins near to the muscles, in order that, by the turgescence or contractions of the latter, the veins may be compressed; and this pressure must necessarily determine the blood to the heart, for the valves of the veins prevent its return to the extremities. Hence an increased pulse, heat and redness of the body; and hence also quick breathing after violent exertion take place.

Farther, those muscles which constantly urge or violently press the contiguous viscera contained in any of the common cavities, powerfully promote the return of the venous blood to the heart. The conjunct pressure of the diaphragm and the abdominal muscles, produces this effect in the abdomen. The pulsations of the arteries, which every where run contiguous and parallel to the sides of the veins, have no inconsiderable effect in promoting the return of the venous blood; and it has already been shewn, that any impulse acting on the veins can determine the blood they transmit only to the heart.

To these is added a force, not yet sufficiently explained, by which the blood is brought from a more compressed to a more lax, and less resisting part. To this process also is respiration very instrumental; in which the motion of the blood into the lungs, when relaxed, is accelerated by the derivation from all parts of the body: and again, in expiration, it is driven into the trunks of the veins of the head and abdomen; hence the swelling of the veins of the brain, in the time of expiration. The circulation is not indeed assisted by these causes, but the blood is agitated and pressed. The anastomoses of the arteries contribute to the same end; for they facilitate the passage of the blood from those places where it is obstructed to such as are more unrestrained.

Hence it is that in a healthy person using sufficient exercise of body, the blood moves with such a velocity, as suffices to deliver as much blood by the vena cava to the heart, as is sent out by the aorta. But rest or inactivity of body, and a weakness of the contracting fibres of the heart and other muscles, frequently render this motion of the venous blood more difficult. Hence result the varices in the legs of women with child, and also the piles; which latter too are partly owing to the deficiency of valves in the vena portarum. Hence also the menses. And when the veins return their blood too slowly to the heart, the perspirable fluids stagnate, and produce frequently œdematous swellings in the lower extremities of weak people.

If an ounce of blood be sent out from the left ventricle of the heart, the time in which it returns to the right ventricle, and which is commonly reckoned that in which the greater circulation is performed, is uncertain. Suppose the quantity of blood thrown out of the heart at every pulsation to be $1\frac{1}{2}$ ounces, and the whole quantity of the blood to be 336 ounces, then a complete circulation is performed in the time of 224 pulsations; that is to say, in about three minutes.

Mr. Fyffe observes, that the effects which the motion of the heart and arteries produces upon the blood are various. "They may be deduced and estimated," says he, "from their causes; if we compare the blood of a living with that of a dead animal; that of a healthy with that of a diseased animal; and lastly, that of an active with that of an inactive animal. In the living animal, the blood is considerably warm; it looks red, with a sort of purple florid hue; it seems to be homogeneous or uniform, and alike in all its parts, though it is really a mixture of different principles. It consists almost entirely of particles commonly called globules; it flows very readily through the least vessels; and lastly, when drawn from the vessels, it exhales a volatile vapour, which we have already particularly described. In the dead animal which has not yet begun to corrupt or putrify, we observe, that the blood has lost a great deal of its redness; that it separates into two parts, namely, one more dense, called crassamentum, and the other more fluid called serum; and that when drawn from its vessels, it exhales no vapour, and coagulates either wholly or in part. When the living animal becomes weak, and some small remains of pulse and respiration continue, we find the blood considerably cold. If, again, you compare the blood of a human person, inactive both in body and mind, with the blood of one that is naturally disposed to much exercise, you will observe the latter has a greater heat; a more intense redness; a substance more compact: that it is specifically heavier; and that the volatile parts are more abundant. All which appearances seem manifestly to be the effects of the motion of the heart and arteries, since they increase and diminish with that motion, and disappear when it ceases.

"That we may understand the manner in which these appearances are produced in the blood, we must consider what are the effects of the heart impelling it; and of the arteries alternately compressing and urging it forward. And first we see, that the heart throws the blood with very great velocity into the crooked or inflected arteries, in such a manner that the globules, expelled through the right side of the opening of the aorta, strike against the left side of the artery; from whence being repelled, they incline towards the right side, whereby all particles of the blood are agitated with a confused or turbulent and whirling motion. The blood thus impelled against the flexile and curved sides of the arteries, of necessity dilates and distends them; and lastly, in the smaller vessels, capable of receiving only one, or a few, globules of blood, all the particles of blood come so intimately into contact with, and grate against, the sides of the artery, that they are even obliged to change their figure in order to gain a passage into the veins.

"But the arteries, by their elastic force, reacting upon the impinging blood, repel it from their sides towards their axis; and at last transmit every single particle of it through the circular mouths of the least vessels, by which the arteries and veins join together.

"There is, therefore, a very great degree of friction, as well from the blood particles upon the sides of the arteries as from the arteries themselves contracting round the blood; to which add, the attrition of the particles of blood against each other by the confused and vortical motion with which they are propelled. The effects of this friction may be computed from the viscid and inflammable nature of the blood itself, from the narrowness of the vessels through which it runs, from the strong impulse of the heart, from the powerful reaction of the arteries, and from the weight of the incumbent parts. This friction is the principal cause of the blood's fluidity, by perpetually removing the points of contact in its particles, by resisting their attraction of cohesion, and by mixing together particles of differents kinds. It also in some measure augments the roundness of the particles, by breaking off the protuberances and rounding their corners. But even these very small particles themselves, which are broken off from the large particles of the blood, put on a round figure by their friction against the sides of the canals, and by their rotatory motion. By a deficiency of motion, the blood coagulates in the vessels before death. The lost fluidity of the blood is again restored upon reco-

vering the motion of the heart, as we are taught by experiments made on living animals. It is probable that the motion of the blood, and the density proceeding from it, are the cause of the red colour of the blood, since the redness is in proportion to the density, and increases or decreases from the same causes which increase or diminish the density. The redness seems to arise from a mixture of the ferruginous with the oily part of the blood."

Here the author asks, "Does the heat of the blood also proceed from its motion?" "We observe, by experiments," says he, "that heat arises from the motion of all kinds of fluids, even of air itself; but much more does attrition produce heat in the inflammable animal juices, which are denser than water, and considerably compressed by contractile and converging tubes. Is not the truth of this sufficiently evinced, by the blood's being warm in those fish which have a large heart, and cold in such as have a small one; their respective heats having the same proportion to each other, as their hearts have to their whole body? Is it not also proved from the more intense heat of birds that have a larger heart, and quick pulsations? from the increase of animal heat, that ensues from exercise of all kinds, and even from the bare friction of parts? from the congelation of all the humours of the human body in a certain degree of cold, in which a man grows stiff, although he yet retains some warm blood, and is alive? and from the coldness of such people as have a weak pulse? The heat does not proceed from any degree of putrefaction in the blood; for the humours themselves, when left at rest, generate no heat; nor can we explain the phenomenon of heat from the action of such an obscure being as the *vital power*. Although the heat may be greater when the pulse is slow, and less when it is more frequent, the difference may arise from the different disposition of the blood, from the different densities of the vessels, &c." This, however, is otherwise explained under the article Animal Heat.

Mr. Fyffe asserts, that the same cause also impedes putrefaction, by not suffering the intestine motion to be diminished, and by dissipating such putrescent particles as have already begun to be formed; but some have hesitated to admit this.

"The different natures," continues he, "of the several particles themselves, which conjunctly make up the mass of blood, are the causes by which, from the impetus of the heart alone, different effects are produced in different particles of the blood; namely, those particles move quicker, whose greater density makes them receive a greater impetus, and whose apt figure or less extended surface makes them meet with less resistance in the fluid in which they move. Those also are driven along more swiftly, which, either from the weight, or from the direction in which they pass out from the heart, are urged chiefly into the axis of the vessel. Those again, which have the greatest projectile motion, will strike against the convexities of the flexures in the arteries; while the other parts of greater bulk and tenacity, having less projectile motion, will move slowly in the concavity of the vessel. And in this manner, the blood is prepared or disposed for the several secretions.

"The systole of the arteries renders the parts of their contained fluids more dense or compact: for they contract round the blood as round a viscid and compressible obstacle, and thus they expel the more liquid parts into the lateral ducts, at the same time increasing the points of contact between the particles themselves, combining the more large and dense particles, and condensing the looser particles. The density of the blood is partly as the number of globules, and partly as the density of the materials which compose them.

"Moreover, the mouths of the least vessels, pervious to only one globule at a time, seem to be moulds for breaking off the angular eminences of the particles of the blood, and reducing them to a globular figure. According to the observation of Mr. Hewson, the particles of the blood are not perfect globules, but flat like pieces of money. (See Blood).

"The reticular distributions and inosculations of arteries remove all danger of obstruction; since, in any part of the artery, where the blood begins to form an obstruction, by sticking in it, a contrary flux is admitted, by which the obstructing matter is repelled to a larger part of the trunk; and thus between the reflux and the direct torrent of the blood, the matter is broken and attenuated. This mechanism also supplies the deficiency from an irremoveable obstruction or the loss of a vessel, by causing a greater distention or enlargement of the next adjoining or anastomosing vessel; as is proved by experience in surgery, after tyeing and cutting a great artery. The collision of these opposite torrents of blood somewhat decrease its velocity; and the reticular distribution augments the friction of the particles."

As the accelerated motion of the blood in the larger trunks conduces to sanguification, so its retarded motions in the least vessels conduce to the secretions. In the more considerable arteries we see the different particles of the blood whirled about among each other with a rapid and confused motion; but, in the lesser ramifications, the progressive motion of the blood being diminished, the more loose and colourless particles pass off laterally from the more dense and red particles; while the latter, keeping on their course more firmly along the axis of the vessel, expel the former by a lateral motion. Thus the attractive powers of the particles of the blood increase as their progressive motion abates: hence the oily or fat particles are drawn one to another, and go off by the open la-

teral ducts that lead to the cellular substance; which particles we know are both gross and sluggish: and again, other thinner juices are sent off through lateral branches of a much smaller orifice, till at length little more than the red blood alone remains to pass through the coalescent artery into the incipient vein: but we shall consider, in its proper place, those processes by which the blood is disposed for the secretions requisite for the purposes of the body.

The *general distribution of the Arteries*, may be seen in the following table; and each may be also referred to under its particular name.

Table of the Arteries.

We have already said that all the arteries originate from the pulmonary artery and the aorta, and that the former emerges from the right ventricle of the heart, and soon divides into a right and left branch, distributed through the lungs.

The AORTA arises from the left ventricle of the heart, and supplies every part of the body with blood in the following manner:

a. It first forms an *arch;*

b. It then descends along the spine, and is called *descending aorta.*

c. It divides into the two *iliacs.*

(a.) The ARCH OF THE AORTA gives off three branches.

First, The *arteria innominata*, which divides into the *right carotid* and *right subclavian.*

Secondly, The *left carotid.*

Thirdly, The *left subclavian.*

I. The *carotids* are divided into *external* and *internal.*

The EXTERNAL CAROTID gives off

1. The *thyroid*,
2. The *lingual*,
3. The *labial*,
4. The *inferior pharyngeal*,
5. The *occipital*,
6. The *posterior auris*,
7. The *internal maxillary*, from which the *spinous artery of the dura mater*, the *lower maxillary*, and *several branches about the palate and orbit* arise.
8. The *temporal.*

The INTERNAL CAROTID produces

1. The *ophthalmic*,
2. The *middle cerebral*,
3. The *communicans*, which inosculates with the *vertebral.*

II. The SUBCLAVIANS give off the following branches:

1. The *internal mammary*, from which the *thymic, comes phrenici, pericardiac*, and *phrenico-pericardiac arteries* arise,
2. The *inferior thyroid*, which gives off the *tracheal, ascending thyroid*, and *transversalis humeri.*
3. The *vertebral*, which proceeds within the vertebræ, and forms within the cranium the *basilary artery*, from which the *anterior cerebelli*, the *posterior cerebri*, and *many branches about the brain* are given off,
4. The *cervicalis profunda*,
5. The *cervicalis superficialis*,
6. The *superior intercostal*,
7. The *supra-scapular.*

As soon as the subclavian arrives at the arm-pit, it is called the *axillary artery;* and when the latter reaches the arm, it is called the *brachial.*

The AXILLARY ARTERY gives off

1. *Four mammary arteries*,
2. The *sub-scapular*,
3. The *posterior circumflex*,
4. The *anterior circumflex*, which ramify about the shoulder joint.

The BRACHIAL ARTERY gives off

1. *Many lateral branches*,
2. The *profunda humeri superior*,
3. The *profunda humeri inferior*,
4. The *great anastomosing artery*, which ramifies about the elbow joint;

The *brachial artery* then divides, about the bend of the arm, into the *ulnar* and *radial arteries*, which are ramified to the ends of the fingers.

The ULNAR ARTERY gives off

1. *Several recurrent branches*,
2. The *common interosseal*, of which the *dorsal ulnar*, the *palmaris profunda*, the *palmary arch*, and the *digitals*, are branches.

The RADIAL ARTERY gives off

1. The *radial recurrent*,
2. The *superficialis volæ*, and then divides into the *palmaris profunda* and the *digitals.*

(b.) The DESCENDING AORTA gives off the following branches:

In the breast,

1. The *bronchial*,
2. The *æsophageal*,
3. The *intercostals*,
4. The *inferior diaphragmatic.*

Within the abdomen,

1. The *cœliac*, which divides into three branches:
   1. The *hepatic*, from which are given off, before it reaches the liver,
      α. The *duodeno-gastric*, which sends off the *right gastro-epiploic* and the *pancreatico-duodenal*,
      β. The *pylorica superior hepatica;*
   2. The *coronaria ventriculi*,
   3. The *splenic*, which emits the *great* and *small pancreatics*, the *posterior gastric*, *left gastro-epiploic*, and the *vasa brevia;*
2. The *superior mesenteric*,
3. The *emulgents*,
4. The *spermatics*,

5. The *inferior mesenteric*,
6. The *lumbar arteries*,
7. The *middle sacral.*

(c.) The aorta then bifurcates into the ILIACS, each of which divide into EXTERNAL and INTERNAL.

The INTERNAL ILIAC, called also *hypogastric*, affords :

1. The *lateral sacrals*,
2. The *gluteal*,
3. The *ischiatic*,
4. The *pudical*, from which the *external hæmorrhoidal*, the *perineal*, and the *arteriæ penis* arise,
5. The *obturator.*

The EXTERNAL ILIAC gives off, in the groin,

1. The *epigastric*,
2. The *circumflexa iliaca ;*

It then passes under Poupart's ligament, and is called the *femoral artery*, and sends off

1. The *profunda*,
2. The *ramus anastomoticus magnus*, which runs about the knee joint ;

Having reached the ham, where it gives off some small branches, it is termed the *popliteal.* It then divides into the *anterior* and *posterior tibial.*

The TIBIALIS ANTICA gives off

1. The *recurrent artery*,
2. The *internal malleolar*,
3. The *external malleolar*,
4. The *tarsal*,
5. The *metatarsal*,
6. The *dorsalis externa halicus.*

The POSTERIOR TIBIAL sends off

1. The *nutritia tibiæ*,
2. Various *small branches*,
3. The *internal plantar*,
4. The *external plantar*, from which an *arch* is formed, that gives off the *digitals of the toes.*

In plate IV. we have given a view of the Arteries, of which the following is an explanation :

Fig. 1. Shews the *aorta* or *great artery*, cut from its origin at the orifice of the left ventricle of the heart.

a. The three semilunar valves of the *aorta*, as they appear when they prevent the blood from coming back into the left ventricle, when the heart is in *diastole.*

2. The trunks of the *coronary arteries* of the heart, arising from the beginning of the *aorta.*

3. The *ligamentum arteriosum.*

4. The *subclavian arteries* arising from the *aorta*, to which the axillary and humeral arteries (23, 23,) are continued.

5. The two *carotids ;* the right arising from the subclavian, the left from the *aorta.*

6. The two *vertebral arteries* arising from the *subclavian*, which pass through all the transverse processes of the *vertebræ* of the neck, from whence they are here freed.

7. The arteries which supply the lower part of the face, tongue, and adjacent muscles, and glands.

8. The trunks of the temporal arteries springing from the *carotids*, and giving branches to the *parotid* glands, and to (9, 9,) the neighbouring muscles, hairy scalp, and forehead.

10. Trunks which send blood to the *nares*, particularly the glands of its *mucous membrane.*

11. The *occipital arteries*, whose trunks pass close by the mammiform process, and are distributed on the hinder part of the hairy scalp, where they are inosculated with the branches of the temporal arteries.

12. Arteries, which carry blood to the *fauces*, and muscles of those parts.

b. A small portion of the *basis* of the skull, that is perforated by the artery of the *dura mater*, here exhibited with part of the *dura mater* attached to it.

13. The contorsions of the *carotid* arteries, before they pass the *basis* of the skull to the brain.

14. Those parts of the *carotid* arteries, where they pass on each side of the *sella turcica*, where are given off many small branches contributing to the *circulus arteriosus.*

c. The *glandula pituitaria*, taken out of the *sella turcica*, lying between the contorted trunks of the *carotid* arteries, 14, 14.

d. The *arteriæ ophthalmicæ*, which spring from the internal *carotids* before they enter the *pia mater.*

15. The contorsions of the *vertebral arteries* as they pass the tranverse processes of the first *vertebræ* of the neck, towards the great *foramen* of the *os occipitis.*

16. The two trunks of the vertebral arteries, that lie on the *medulla oblongata.*

17. The communicating branches between the *carotid* and *cervical* arteries.

18. The ramifications of the arteries within the skull. The larger trunks lie between the lobes of the brain, and in its *sulci.* From the extremities of these arteries of the brain, are continued its veins, whose trunks vary much in their continued position from the arteries ; the latter entering the brain at its *basis*, and distributing themselves through its substance, whereas the trunks of the veins are first extended on the surface of the brain, and then discharge their blood into the *longitudinal sinus.* Nor do the veins of the brain accompany their arteries at their ingress, as happens in other parts, and as the arteries and veins of the *dura mater* do ; both passing through the same *foramen* in the *basis* of the skull, *b*, *b*.

e. The arteries of the *cerebellum.*

19. The arteries of the *larynx*, *thyroid gland*,

and adjacent parts. They arise from the subclavian arteries.

20. Other arteries arising near the former. These convey blood to the muscles of the neck and *scapula.*

21. The *mammariæ*, which arise also from the subclavian arteries, and descend on the cartilages of the true ribs internally, about half an inch distant on each side the *sternum.* Some branches of these pass through the pectoral and intercostal muscles, and give blood to the *mammæ*, where they meet and are inosculated. The mammary arteries join with the large trunks of the *epigastrics* (57, 57). The extremities of the intercostal and lumbal arteries also inosculate with each other.

22. The arteries which supply the muscles of the *humerus*, and some of those of the *scapula.*

23. Those portions of the large trunks of the arteries of the arm, which are liable to be wounded in opening the *vena basilica*, or innermost of the three veins in the bending of the elbow.

24. The divisions of the arteries of the arm below the flexure of the elbow.

25. A communicating branch of an artery arising from the trunk of the humeral artery above its flexure at the cubit. It is inosculated with the arteries below. In some subjects this branch is not found, but, instead of it, many smaller branches of the same kind. By these communicating branches (of the upper part of the brachial artery with the vessels of the cubit) the blood still passes although the trunk (23.) be taken up, as when wounded, or in the case of an *aneurism.*

26. The external artery of the cubit, which affords the pulse near the *carpus.*

27. The arteries of the hands and fingers.

28. The descending aorta.

29. The *arteria bronchialis* springing from one of the intercostals. It sometimes arises immediately from the descending trunk of the *aorta*, at others from the superior intercostal artery, which springs from the subclavian. These bronchial arteries inosculate with the pulmonary arteries.

30. A small artery springing from the anterior part of the *aorta descendens*, passing to the *gula.* *Ruysch* describes branches of arteries from the superior intercostal, which go to the *gula.*

31. The intercostal arteries on each side of the *aorta descendens.*

32. The trunk of the *arteria cœliaca*, from whence spring, 33. The hepatic arteries, and 34. The *arteria cystica*, distributed on the gall-bladder.

35. The *arteria gastrica*, or *coronaria ventriculi, inferior.* 36. The *pylorica.*

37. The *epiploica dextra*, *sinistra*, and *media*, springing from the *coronaria.*

38. The ramifications of the coronary artery, which embrace the bottom of the stomach.

39. *Coronaria ventriculi superior.*

40. The phrenic, or two arteries of the diaphragm; that of the left arising from the trunk of the *aorta*, the right springing from the *cœliaca.*

41. The trunk of the *splenic artery*, arising from the *cœliaca*, in a contorted form.

42. Two small arteries going to the superior part of the *duodenum* and *pancreas.* The rest of the arteries of the *pancreas* spring from the splenic artery in its passage to the spleen.

43. The trunk of the *arteria mesenterica superior*, turned towards the right side.

44. The branches of the superior mesenteric artery, freed from the small intestines. Here the various *anastomoses*, which the branches of this artery make in the mesentery before they arrive at the intestines, may be observed.

45. The inferior mesenteric artery, arising from the *aorta.* At 46, is a remarkable *anastomosis* of this artery with the superior mesenteric.

47. The branches of the inferior mesenteric artery, as they pass to the *colon.* 48. Those of the *rectum.*

49. The *emulgent* arteries of the kidnies.

50. The *vertebral* arteries of the loins.

51. The *spermatic* arteries, which descend to the *testes*, and are so small, as to escape being filled with wax injection.

52. *Arteria sacra.*

53. *Arteriæ iliacæ.*

54. *Rami iliaci externi.*

55. *Iliaci interni;* which are larger in the *fœtus* proportionably, than in the adult, because of their conjunction with the two umbilical arteries.

56. The two umbilical arteries cut off: that of the right side being drawn as in the *fœtus;* the left expressed as in an adult.

57. The epigastric arteries, which ascend under the right muscles of the *abdomen*, and are inosculated with the *mammariæ*, as abovementioned.

58. Branches of the external iliac arteries, passing between the two oblique muscles of the *abdomen.*

59. Branches of the internal iliac arteries, which convey blood to the *extensores* and *obturatores* muscles of the thighs.

60. The trunks of the arteries which pass to the *penis.*

61. The arteries of the urinary bladder.

62. The internal arteries of the *pudendum*, which, with those here shewn of the *penis*, make the hypogastric arteries in women. The external arteries of the *pudendum*, arise from the upper part of the crural artery, which is that immediately below the epigastric.

63. The *penis* distended with air and dried.

64. The *glans penis.* 65. The upper part, or *dorsum penis* cut from the body of the *penis*, and raised to shew the *corpora cavernosa.* 66. The *corpora cavernosa penis* freed from the *ossa pubis*, and tied after inflation.

67. The two arteries of the *penis*, as they appear injected with wax, in each *corpus cavernosum.*

68. The *capsula*, and *septum* of the *corpora cavernosa penis.*

69. The crural arteries.

70. The arteries which pass to the muscles of the thighs and *tibiæ.*

71. That part of the crural artery that passes the ham, where it takes the name of *popliteal.*

72. The three large trunks of the arteries of the leg.

73. The arteries of the foot, with their communicating branch, from their superior to their inferior trunk, as well as their communications at the extremity of each toe, like those of the fingers.

By comparing the same figures on each side, some of the variations which occur in different subjects may be traced.

The healthy functions of the arteries, it is well known, are extremely important. Their deviations will be noticed, of course, under different heads of disease in which the pulse is to be consulted. The *diseases affecting the structure of arteries* are, 1. Aneurism, (See ANEURISMA). 2. Ossification, (See OSSIFICATION). 3. A peculiar laxity and weakness of texture, observed by some anatomists in the dissection of scrofulous subjects, but of which no account has yet been given by authors.

To what has been said of Aneurism we may add the following extract from the third case, described, in the Medical and Physical Journal, by Mr. Astley Cooper, who employed Mr. H. Cline's method of securing the artery. "An incision being made on the middle of the inner part of the thigh, and the femoral artery exposed, the artery was separated from the vein and nerve, and all the surrounding parts, to the extent of an inch, and an eyed probe, armed with a double ligature, having a curved needle at each end, was conveyed under the artery, and the probe cut away. The ligature nearest the groin was first tied; the other was separated an inch from the first, and tied also: then the needles were passed through the coats of the artery, close to each ligature, and between them; the thread they carried was tied into the knot of the ligature which had been already secured around the vessel; and thus a barrier was formed in the artery beyond which the ligature could not pass.

"The wound was united by the first intention, except where the ligature projected; one of the threads separated on the 14th, the other on the 15th day; and upon the 30th of May, the man walked across one of the wards of the hospital. On the 14th of June the wound was healed, and he ceased to suffer any inconvenience from the operation."

The apparatus shewn in plate III. will fully explain the nature of this operation. *a*, Is the probe, armed with the ligature and needles. *b*, The artery tied at two points. c, The part divided by incision. The needle is seen passed through the artery, and the ligature which it carries is to be tied to the thread hanging from the knot upon the vessel.

It has farther been suggested to Mr. Astley Cooper, by Mr. Houlston, a gentleman formerly in the practice of surgery in London, that, possibly, the ancient mode of securing the artery by the *actual cautery* would be desirable in this operation; as the powerful stimulus of fire might eventually tend to excite a healthy action in the coats of the artery, independent of the effect of causing a *retraction of its extremity.* (See CAUTERY). Referring to Mr. Henry Cline's mode of securing the vessel, he says—"What, if, instead of making the upper ligature permanent, it were only applied whilst the division of the artery were making with a *red hot knife?* Or, what if the vessel were at once seized with a pair of red hot *pincers*, without any other precaution than the tourniquet, or a loose thread *ready to be tied*, in case of succeeding hemorrhage." To these queries he adds the following—"Might not the exhibition of the preparations of iron or mercury, or of some other medicine which is known to augment the contractile power of the arteries, advantageously precede, or be used as a *preparative*, to the operation for aneurism?" These hints seem to deserve attention; and if the actual cautery can be used with merely *as great a prospect of security* to the vessel as *the ligature*, the difficulty of applying it, which must be considerable, ought not to deter us from making the attempt.

ARTHANITA, (αρθανιτα; from αρτος, *bread;* because it is the food of swine); the herb sow-bread. See CYCLAMEN.

ARTHRITIS, (from αρθρον, *a joint*, because it is commonly confined to the joint); the GOUT.

Dr. Cullen, in his Nosology, gives it the name of *podagra*, (from πους, *pes*, *the foot*), because that he considers the seat of the idiopathic gout. In his 24th genus of diseases of the class *Pyrexiæ*, or febrile complaints, and *Phlegmasiæ*, or order inflammations, he divides it into four species. 1. PODAGRA REGULARIS, *regular gout*, when the inflammation appears in the joints to a due degree, and after continuing awhile, gradually disappears, and the patient recovers his usual health. 2. PODAGRA ATONICA, *atonic gout*, when there is manifestly the *gouty* diathesis; but from some cause it does not produce the inflammatory affection of the joints, but digestion is disturbed, and the general

health is variously affected. 3. PODAGRA RETROGRADA, *retrograde*, or *retrocedent gout*, when inflammation has as usual attacked the joints, but not with either its usual degree or the usual pain, and then suddenly abates, an internal part as suddenly being affected in its turn. 4. PODAGRA ABERRANS, *misplaced gout*, when the gouty diathesis produces inflammation in some internal part, instead of the joints of the extremities. It is generally and concisely defined "an hereditary disease, arising without any external evident cause, but preceded for the most part by an unusual affection of the stomach; febrile symptoms; pain in the joints, particularly of the great toe, but commonly in those of the feet and hands; returning at intervals, and often alternating with affections of the stomach, and internal parts." The ancients called all kinds of pain, when seated in the joints or the extreme parts, by the common name of *arthritis*.

1. What we call a *paroxysm of the gout* is principally constituted by an inflammatory affection of some of the joints. This sometimes comes on suddenly, without any warning, but is generally preceded by several symptoms; such as the ceasing of a sweating which the feet had been commonly affected with before; an unusual coldness of the feet and legs; a frequent numbness, alternating with a sense of prickling along the whole of the lower extremities; frequent cramps of the muscles of the legs; and an unusual turgescence of the veins.

While these symptoms take place in the lower extremities, the body is affected with some degree of torpor and languor, and the functions of the stomach in particular are more or less disturbed. The appetite is diminished; and flatulency, or other symptoms of indigestion, are felt. These symptoms take place for several days, sometimes for a week or two, before a paroxysm comes on; but commonly, upon the day immediately preceding it, the appetite becomes keener than usual.

The circumstances of gouty paroxysms are chiefly the following. They come on most commonly in the spring, and sooner or later according as the vernal heat succeeds sooner or later to the winter's cold; and, perhaps, sooner or later also, according as the body may happen to be more or less exposed to vicissitudes of heat and cold. The attacks are sometimes felt first in the evening, but more commonly about two or three o'clock in the morning. The paroxysm begins with a pain affecting one foot, most commonly in the ball or first joint of the great toe, but sometimes in other parts of the foot. With the attack of this pain, there is commonly more or less of a cold shivering; which, as the pain increases, gradually ceases; and is succeeded by a hot stage of pyrexia, which continues for the same time with the pain itself. From the first attack, the pain becomes, by degrees, more violent, and continues in this state, with great restlessness of the whole body, till next midnight, after which it gradually remits; and, after it has thus continued for twenty-four hours from the commencement of the first attack, it commonly ceases almost entirely; and, with the coming on of a gentle sweat, allows the patient to fall asleep. The patient, upon his coming out of this sleep in the morning, finds the pained part affected with some redness and swelling, which, after having continued for some days, gradually abate.

When a paroxysm has thus come on, although the violent pain, after twenty-four hours, be considerably abated, the patient is not entirely relieved from it. For some days, he has, every evening, a return of more considerable pain and pyrexia, and these continue with more or less violence till morning. After going on in this manner for several days, the disease sometimes goes entirely off, not to return till after a long interval.

When the disease, after having thus remained for some time in a joint, ceases entirely, it generally leaves the person in very perfect health, enjoying greater ease and alacrity in the functions of both body and mind than he had for a long time before experienced.

At the beginning of the disease, the returns of it are sometimes only once in three or four years; but as it advances, the intervals become shorter, and at length the attacks are annual; afterwards they come twice each year; and at length recur several times during the course of autumn, winter, and spring; and as, when the fits are frequent, the paroxysms become also longer, so in the advanced state of the disease, the patient is hardly ever tolerably free from it, except perhaps for two or three months in summer.

The progress of the disease is also marked by the parts which it affects. At first, it commonly affects one foot only; afterwards every paroxysm affects both feet, the one after the other; and as the disease proceeds, it not only affects both feet at once, but, after having ceased in the foot which was secondly attacked, returns again into the first, and perhaps a second time also into the other. Its changes of place are not only from one foot to another, but from the feet into other joints, especially those of the upper and lower extremities; so that there is hardly a joint of the body which, on one occasion or other, is not affected. It sometimes affects two different joints at the very same time; but more commonly it is at any one time severe in a single joint only, and passes in succession from one joint to another; so that the patient's affliction is often protracted for a great length of time.

When the disease has often returned, and the paroxysms have become very frequent, the pains are commonly less violent than they were at first; but the patient is more affected with sickness, and

the other symptoms of the atonic gout, which shall be hereafter mentioned. After the first paroxysm of the disease, the joints which have been affected are entirely restored to their former suppleness and strength; but after the disease has recurred very often, the joints affected do neither so suddenly nor entirely recover their former state, but continue weak and stiff; and these effects at length proceed to such a degree, that the joints lose their motion entirely.

In many persons, but not in all, after the disease has frequently recurred, concretions of a chalky nature are formed upon the outside of the joints, and for the most part immediately under the skin. The matter seems to be deposited at first in a fluid form, afterwards becoming dry and firm. In their firm state, these concretions are a hard earthy substance, very entirely soluble in acids. After they have been formed, they contribute, with other circumstances, to destroy the motion of the joint.

In most persons who have laboured under the gout for many years, a nephritic affection comes on, and discovers itself by all the symptoms which usually attend calculous concretions in the kidneys, and which we shall have occasion to describe in another place. All that is necessary to be observed here is, that the nephritic affection alternates with paroxysms of the gout; and that the two affections, the nephritic and the gouty, are hardly ever present at the same time. This also may be observed, that children of gouty or nephritis parents commonly inherit one or other of these diseases; but whether the principal disease of the parent may have been either gout or nephritic alone, some of the children have the one and some the other. In some of them, the nephritic affection occurs alone, without any gout supervening; and this happens to be frequently the case with the female children of gouty parents.

In the whole of the history already given, we have described the most common form of the disease, and which, therefore, however diversified in the progress of it, may be still called the regular state of the gout. Upon some occasions, however, the disease assumes different appearances: but as we suppose the disease to depend always on a certain diathesis, or disposition of the system: so every appearance which we can perceive to depend upon that same disposition, we still consider as a symptom and case of the gout. The principal circumstance, in what we term the *regular gout*, is the inflammatory affection of the joints; and whatever symptoms we can perceive to be connected with, or to depend upon, the disposition which produces that inflammatory affection, but without its taking place, or being present at the same time, we name the *irregular gout*.

Of such irregular gout there are three different states, which, as has been observed, are named the *atonic*, the *retrocedent*, and the *misplaced* gout.

(1.) The first is, when the gouty diathesis prevails in the system; but, from certain causes, does not produce the inflammatory affection of the joints. In this case, the morbid symptoms which appear are chiefly affections of the stomach, such as loss of appetite, indigestion, and its various attendants of sickness, nausea, vomiting, flatulency, acid eructations, and pains in the region of the stomach. These symptoms are frequently accompanied with pains and cramps in several parts of the trunk and the upper extremities of the body, which are relieved by the discharge of wind from the stomach. Together with these affections of the stomach, there commonly occurs a costiveness; but sometimes a looseness, with colic pains. These affections of the alimentary canal are often attended with all the symptoms of hypochondriasis, such as dejection of mind, a constant and anxious attention to the slightest feelings, an imaginary aggravation of these, and an apprehension of danger from them.

In this same atonic gout, the viscera of the thorax also are sometimes affected, and palpitations, faintings, and asthma, occur. In the head also arise headachs, giddiness, apoplectic, and paralytic affections.

When the several symptoms now mentioned occur in habits having the marks of a gouty disposition, this may be suspected to have laid the foundation of them; and especially when either, in such habits, a manifest tendency to the inflammatory affection has formerly appeared, or when the symptoms mentioned are mixed with, and are relieved by, some degree of the inflammatory gout. In such cases there can be no doubt of considering the whole as a state of the gout.

(2.) Another state of the disease we name the *retrocedent* gout. This occurs when an inflammatory state of the joints has, in the usual manner, come on, but without arising to the ordinary degree of pain and inflammation; or at least without these continuing for the usual time, or without their receding gradually in the usual manner: these affections of the joints suddenly and entirely cease, while some internal part becomes affected. The internal part most commonly attacked is the stomach; which then is affected with anxiety, sickness, vomiting, or violent pain: but sometimes the internal part is the heart, which gives occasion to a syncope; sometimes it is the lungs, which are affected with asthma; and sometimes it is the head, giving occasion to apoplexy or palsy. In all these cases there can be no doubt that the symptoms are all a part of the same disease, however different the affection may seem to be in the parts which it attacks.

(3.) The third state of the irregular gout, which name the *misplaced*, is when the gouty diathesis, instead of producing the inflammatory affection of the joints, produces an inflammatory affection of some internal part, and which appears from the same symptoms that attend the inflammations of those parts arising from other causes.

Whether the gouty diathesis does ever produce such inflammation of the internal parts without having first produced it in the joints, or whether the inflammation of the internal part be always a translation from the joints previously affected, we dare not determine; but even supposing the latter to be always the case, we think the difference of the affection of the internal part must still distinguish the *misplaced*, from what we have named the *retrocedent gout*.

With regard to the misplaced gout, Dr. Cullen, whom we here follow, tells us, that he never met with any cases of it in his practice, nor does he find any distinctly marked by practical writers, except that of a pneumonic inflammation.

There are two cases of a translated gout; the one of which is an affection of the neck of the bladder, producing pain, strangury, and a *catarrhus vesicæ:* the other is an affection of the rectum, sometimes indicated by pain alone in that part, and sometimes by hæmorrhoidal symptoms. In gouty persons such affections have been known to alternate with inflammatory affections of the joints; but whether these belong to the retrocedent or to the misplaced gout, our author pretends not to determine.

It is commonly supposed, that there are some cases of rheumatism which are scarcely to be distinguished from the gout: but these, Dr. Cullen thinks, are but few; and that the two diseases may be, for the most part, distinguished with great certainty, by observing the predisposition, the antecedent circumstances, the parts affected, the recurrence of the disease, and its connexion with the system; which circumstances, for the most part, appear very differently in the two diseases.

2. The gout is generally an hereditary disease: but some persons without any hereditary disposition seem to acquire it; and in some an hereditary disposition may be counteracted from various causes. It attacks the male sex especially; but it sometimes, though more rarely, attacks also the female. The females liable to it are those of the more robust and full habits; and it very often happens to those before the menstrual evacuation hath ceased. Dr. Cullen hath also found it occurring in several females whose menstrual evacuations were mo e abundant than usual.

The gout seldom attacks eunuchs; and when it does, seems to fall upon those who happen to be of a robust habit, to lead an indolent life, and to live very full. It attacks especially men of robust and large bodies, who have large heads, are of full and corpulent habits, and whose skins are covered with a thicker *rete mucosum*, which gives a coarser surface. To speak in the style of the ancient physicians, the gout will seldom be found to attack those of a sanguine, or such as are of a purely melancholic temperament; but very readily those of a *cholerico-sanguine* temperament. It is, however, very difficult to treat this matter with precision. The gout seldom attacks persons employed in constant bodily labour, or those who live much upon vegetable aliment. It does not commonly attack men till after the age of thirty-five; and generally not till a still later period. There are, indeed, instances of the gout appearing more early; but these are few in comparison of the others. When the disease does appear early in life, it seems to be in those who have the hereditary disposition very strong, and to whom the remote causes hereafter mentioned have been applied in a very considerable degree.

As the gout is an hereditary disease, and affects men particularly of a certain habit, its remote causes may be considered as predisponent and occasional. The predisponent cause, as far as expressed by external appearances, has been already marked; and physicians have been very confident in assigning the occasional causes: but in a disease depending so much upon a predisposition, the assigning occasional causes must be uncertain; as in the predisposed the occasional causes may not always appear, and in persons not predisposed they may appear without effect; and this uncertainty must particularly affect the case of the gout.

The occasional causes of the disease seem to be of two kinds. 1. Those which induce a plethoric state of the body. 2. Those which in plethoric habits induce a state of debility. Of the first kind are a sedentary, indolent manner of life, and a full diet of animal food. Of the second kind of occasional causes which induce debility, are excess in venery; intemperance in the use of intoxicating liquors; indigestion, produced either by the quantity or the quality of the aliments; much application to study or business, night-watching, excessive evacuations; the ceasing of usual labour; a sudden change from a very full to a very spare diet; the large use of acids and acescents; and lastly, cold applied to the lower extremities. The former seem to act by increasing the predisposition; the latter are commonly the exciting causes, both of the first attacks, and of the repetitions of the disease.

With respect to the proximate cause of the gout, it has generally been thought that it depends on a certain morbific matter always present in the body; and that this matter, by certain causes, thrown upon the joints or other parts, produces the several phenomena of the disease.

This doctrine, however ancient and generally received, appeared to Dr. Cullen to be very doubtful. For,

(1.) There is no direct evidence of any morbific matter being present in persons disposed to the gout. There are no experiments or observations which show that the blood or other humours of gouty persons are in any respect different from those of others. Previous to attacks of the gout, there appear no marks of any morbid state of the fluids; for the disease generally attacks those persons who have enjoyed the most perfect health, and appear to be in that state when the disease comes on. At a certain period of the disease, a peculiar matter indeed appears in gouty persons; but this, which does not appear in every instance, and which appears only after the disease has subsisted for a long time, seems manifestly to be the effect, not the cause, of the disease. Further, though there be certain acrids which, taken into the body, seem to excite the gout, it is probable that these acrids operate otherwise in exciting the disease, than by affording the material cause of it. In general, therefore, Dr. Cullen thinks there is no proof of any morbific matter being the cause of the gout.

(2.) The suppositions concerning the particular nature of the matter producing the gout, have been so various, and so contradictory, as to allow us to conclude, that there is truly no proof of the existence of any of them. With respect to many of these suppositions, they are so inconsistent with chemical philosophy, and with the laws of the animal œconomy, that they must be entirely rejected.

(3.) The supposition of a morbific matter as the cause, is not consistent with the phenomena of the disease, particularly with its frequent and sudden translations from one part to another.

(4.) The supposition is further rendered improbable by this, that, if a morbific matter did exist, its operation should be similar in the several parts which it attacks: whereas it seems to be very different, being stimulant, and exciting inflammation, in the joints; but sedative and destroying the tone of the stomach: which, upon the supposition of the same particular matter acting in both cases, is not to be explained by any difference in the part affected.

(5.) Some facts alleged in proof of a morbific matter are not sufficiently confirmed; such as those which would prove the disease to be contagious. There is, however, no proper evidence of this, the facts given being not only few, but exceptionable, and the negative observations innumerable.

(6.) Some arguments brought in favour of a morbific matter, are founded upon a mistaken explanation. The disease has been supposed to depend upon a morbific matter, because it is hereditary. But the inference is not just: for most hereditary diseases do not depend upon any morbific matter, but upon a particular conformation of the structure of the body transmitted from the parent to the offspring; and this last appears to be particularly the case in the gout. It may be also observed, that the hereditary diseases depending upon a morbific matter, appear always much more early in life than the gout commonly does.

(7.) The supposition of a morbific matter being the cause of the gout, has been hitherto useless, as it has not suggested any successful method of cure. Particular theories of gout have often corrupted the practice, and have frequently led from those views which might have been useful, and from that practice which experience had approved. Further, though the supposition of a morbific matter has been generally received, it has been as generally neglected in practice. When the gout has affected the stomach, nobody thinks of correcting the matter supposed to be present there, but merely of restoring the tone of the moving fibres.

(8.) The supposition of a morbific matter is quite superfluous; for it explains nothing, without supposing that matter to produce a change in the state of the moving powers; and a change in the state of the moving powers, produced by other causes, explains every circumstance without the supposition of a morbific matter; and it may be observed, that many of the causes exciting the gout, do not operate upon the state of the fluids, but directly and solely upon that of the moving powers.

(9.) Lastly. Dr. Cullen contends, that the supposition of a morbific matter is superfluous; because, without that, the disease can be explained, he thinks, in a manner more consistent with its phenomena, with the laws of the animal œconomy, and with the method of cure which experience has approved. We now proceed to give this explanation; but, before entering upon it, we must premise some general observations which Dr. Cullen states.

The first observation is, that the gout is a disease of the whole system, or depends upon a certain general conformation and state of the body, which manifestly appears from the facts abovementioned. But the general state of the system depends chiefly upon the state of its primary moving powers; and, therefore, the gout may be supposed to be an affection of these chiefly.

The second observation is, that the gout is manifestly an affection of the nervous system; in which the primary moving powers of the whole system are lodged. The occasional or exciting causes are almost all such as act directly upon the nerves and nervous system; and the greater part of the symptoms of the atonic or retrocedent gout are manifestly affections of the same system. This leads us to seek for an explanation of the whole of

the disease, in the laws of the nervous system, and particularly in the changes which may happen in the balance of its several parts.

The third observation is, that the stomach, which has so universal a consent with the rest of the system, is the internal part that is the most frequently, and often very considerably, affected by the gout. The paroxysms of the disease are commonly preceded by an affection of the stomach; many of the exciting causes act first upon the stomach, and the symptoms of the atonic and retrocedent gout are most commonly and chiefly affections of the same organ. This observation leads us to remark, that there is a balance subsisting between the state of the internal and that of the external parts; and, in particular, that the state of the stomach is connected with that of the external parts, so that the state of the tone in the one may be communicated to the other.

3. These observations being premised, Dr. Cullen offers the following *pathology of the gout:*

In some persons there is a certain vigorous and plethoric state of the system, which at a certain period of life is liable to a loss of tone in the extremities. This is in some measure communicated to the whole system, but appears more especially in the functions of the stomach. When this loss of tone occurs while the energy of the brain still retains its vigour, the *vis medicatrix naturæ* is excited to restore the tone of the parts; and accomplishes it, by exciting an inflammatory affection in some part of the extremities. When this has subsided for some days, the tone of the extremities and of the whole system is restored, and the patient returns to his ordinary state of health.

This is the course of things in the ordinary form of the disease, which we name the *regular gout;* but there are circumstances of the body, in which this course is interrupted or varied. Thus, when the atony has taken place, if the reaction do not succeed, the atony continues in the stomach, or perhaps in other internal parts; and produces that state which Dr. Cullen, for reasons now obvious, named the *atonic gout.*

A second case of variation in the course of the gout is, when, to the atony, the reaction and inflammation have to a certain degree succeeded, but from causes either internal or external, the tone of the extremities and perhaps of the whole system is weakened; so that the inflammatory state, before it had either proceeded to the degree, or continued for the time, requisite for restoring the tone of the system, suddenly and entirely ceases: whence the stomach, and other internal parts, relapse into the state of atony; and perhaps have that increased by the atony communicated from the extremities: all which appears in what has been termed the *retrocedent state of the gout.*

A third case of variation from the ordinary course of the gout, is, when, to the atony usually preceding, an inflammatory reaction fully succeeds, but has its usual determination to the joints by some circumstances prevented; and is therefore directed to some internal part, where it produces an inflammatory affection, and that state of things which we have named the *misplaced gout.*

Though this theory of Dr. Cullen's be supported with much ingenuity, yet we may confidently venture to assert, that, on this subject, he has been less successful in establishing his own opinion, than in combating those of others; and this theory, as well as those formerly proposed, is liable to numerous and insurmountable objections. According to the hypothesis, a vigorous and plethoric habit should in every case exist prior to the appearance of gout; which is by no means consistent with fact: nor is it true that a vigorous and plethoric habit is liable at a certain age to a loss of tone in the extremities; which is another necessary condition in the hypothesis. Loss of tone often occurs in the extremities without exerting any peculiar influence on the stomach; and why a loss of tone in the stomach should excite the *vis medicatrix naturæ*, to restore it by exciting an inflammatory affection in some part of the extremities, is very inconceivable. Were the hypothesis true, every dyspeptic patient should infallibly be affected with gout; which, however, is by no means the case. In short, every step in the theory is liable to insurmountable objections; and it by no means, any more than former hypotheses, explains the phenomena of the disease, particularly what Dr. Cullen has himself so accurately pointed out, the connexion of gouty with calculous complaints.

A very ingenious work was published a few years ago, by an anonymous author, entitled "a Treatise on Gravel and upon Gout;" in which the sources of each are investigated, and effectual means of preventing or removing these diseases recommended. In this treatise an attempt is made to prove, that both diseases depend upon a peculiar concreting acid, the acid of calculi, or the *lithic acid*, as it is styled by modern chemist. He supposes this acid, constantly present to a certain degree in the circulating fluids, to be precipitated by the introduction of other acids; and in this manner he explains the influence of acid wines and other liquors, as claret, cyder, &c. in inducing gout; for he considers the circumstance chiefly constituting the disease as being an inflammation in parts of which the functions have been interrupted by the redundant acid precipitated. Although this theory be supported with much ingenuity, yet it is also liable to many objections. The sudden attack of the affection; its sudden transition from one part of the body to another; the instant relief of one part when another comes to be affected; and the various anomalous forms which the disease puts

on, having an exact resemblance to different affections, are altogether irreconcilable to the idea of its depending on any fixed obstruction at a particular part arising from concreting acid. Nor does the plan of prevention and cure which he proposes, and which consists chiefly in abstinence from acid and in the destruction of acid, by any means correspond in every particular to the best established facts respecting the treatment of gout; to which we next proceed.

4. An important part of our subject, is the *prevention and treatment*. In entering upon this, we must observe, in the first place, that a cure has been commonly thought impossible: and we acknowledge it to be very probable, that the gout, as a disease of the whole habit, and very often depending upon original conformation, cannot be cured by medicines, the effects of which are always very transitory, and seldom extend to the producing any considerable change of the whole habit.

It would perhaps have been happy for gouty persons if this opinion had been implicitly received by them, as it would have prevented their having been so often the dupes of self-interested pretenders, who have either amused them with inert medicines, or have rashly employed those of the most pernicious tendency. Dr. Cullen, who has treated of the cure of the disease with great judgment, as he has done the theory with much ingenuity, is much disposed to believe the impossiblity of a cure of the gout by medicines; and more certainly still inclined to think, that, whatever may be the possible power of medicines, yet no medicine for curing the gout has hitherto been found. Although almost every age presented a new remedy, all hitherto offered have, very soon after, been either neglected as useless, or condemned as pernicious; a fate which probably awaits the new-fledged practice of *applying ice-cold water to gouty limbs*. See Cold.

But, though unwilling to admit the power of medicines, yet he contends, that a great deal can be done towards the cure of the gout by a regimen: and he is firmly persuaded, that any man who, early in life, will enter upon the constant practice of bodily labour, and of abstinence from animal food, will be preserved entirely from the disease.

Whether there be any other means of radically curing the gout, the doctor is not ready to determine. There are histories of cases of the gout, in which it is said, that, by great emotions of the mind, by wounds, and by other accidents, the symptoms have been suddenly relieved, and never again returned; but how far these accidental cures might be imitated by art, or would succeed in other cases, is at least extremely uncertain.

The practices proper and necessary in the treatment of the gout, are to be considered under two heads: *first*, As they are to be employed in the intervals of paroxysms; or, *secondly*, As during the time of them. In the intervals of paroxysms, the indications are, to prevent altogether the return of paroxysms; or, at least, to render them less frequent, and more moderate. During the time of paroxysms, the indications are, to moderate the violence and shorten the duration of them as much as can be done with safety.

It has been already observed, that the gout may be entirely prevented by *constant bodily exercise*, and by a *low diet;* and Dr. Cullen is of opinion, that this prevention may take place even in persons who have an hereditary disposition to the disease. Even when the disposition has discovered itself by several paroxysms of inflammatory gout, he is persuaded that labour and abstinence will absolutely prevent any returns of it for the rest of life. These, therefore, are the means of answering the first indication to be pursued in the intervals of paroxysms.

Exercise in persons disposed to the gout, in Dr. Cullen's opinion, takes effect by answering two purposes: one of these is the strengthening of the tone of the extreme vessels; and the other, the guarding against a plethoric state. For the former, if exercise be employed early in life, and before intemperance has weakened the body, a very moderate degree of it will answer the purpose; and, for the latter, if abstinence be at the same time observed, little exercise will be necessary.

With respect to exercise, this in general is to be observed, that it should never be violent; for, if violent, it cannot be long continued, and must always endanger the bringing on an atony in proportion to the violence of the preceding exercise. It is also to be observed, that the exercise of gestation, though considerable and constant, will not, if it be entirely without bodily exercise, answer the purpose in preventing the gout. For this end, therefore, the exercise must be in some measure that of the body; and must be moderate, but at the same time constant and continued through life.

In every case and circumstance of the gout in which the patient retains the use of his limbs, bodily exercise, in the intervals of paroxysms, will be always useful; and, in the beginning of the disease, when the disposition to it is not yet strong, exercise may prevent a paroxysm which otherwise might have come on. In more advanced states of the disease, however, when there is some disposition to a paroxysm, much walking will bring it on; either as it weakens the tone of the lower extremities, or as it excites an inflammatory disposition in them; and thus it seems to be that strains or contusions often bring on a paroxysm of the gout.

Abstinence, the other part of the proper regimen for preventing the gout, is of more difficult application. If an abstinence from animal food be

entered upon early in life, while the vigour of the system is yet entire, Dr. Cullen has no doubt of its being both safe and effectual: but, if the motive for this diet shall not have occured till the constitution has been broken by intemperance, or by the decline of life, a low diet may then endanger the bringing on an atonic state. Further, if a low diet be entered upon only in the decline of life, and be at the same time a very great change from the former manner of living, the withdrawing of an accustomed stimulus of the system may readily throw this into an atonic state.

The safety of an abstemious course may be greater or less according to the management of it. It is animal food which especially disposes to the plethoric and inflammatory state, and that food is to be therefore especially avoided; but, on the other hand, vegetable aliment of the lowest quality is in danger of weakening the system too much by not affording sufficient nourishment, and more particularly of weakening the tone of the stomach by its ascescency. It is therefore a diet of a middle nature that is to be chosen; and milk is precisely of this kind, as containing both animal and vegetable matter. As approaching to the nature of milk, and as being a vegetable matter containing the greatest portion of nourishment, the farinaceous seeds are next to be chosen, and are the food most proper to be joined with milk.

With respect to drink, fermented liquors are useful only when they are joined with animal food, and that by their ascescency; and their stimulus is only necessary from custom. When, therefore, animal food is to be avoided, fermented liquors are unnecessary; and, by increasing the ascescency of vegetables, these liquors may be hurtful. The stimulus of fermented or spirituous liquors is not necessary to the young and vigorous, and, when much employed, impairs the tone of the system. These liquors, therefore, are to be avoided, except so far as custom and the declining state of the system may have rendered them necessary. For preventing or moderating the regular gout, water is the only proper drink.

With respect to an abstemious course, it has been supposed, that an abstinence from animal food and fermented liquors, or the living upon milk and farinacea alone for the space of one year, might be sufficient for a radical cure of the gout: and it is possible that, at a certain period of life, in certain circumstances of the constitution, such a measure might answer the purpose. But this is very doubtful; and it is more probable, that the abstinence must, in a great measure, be continued, and the milk diet be persisted in, for the remainder of life. It is well known, that several persons who had entered on an abstemious course, and had been thereby delivered from the gout, have, however, upon returning to their former manner of full living, had the disease return upon them with as much violence as before, or in a more irregular and more dangerous form.

It has been alleged, that, for preventing the return of the gout, blood-letting by scarifications of the feet, frequently repeated, and at stated times, may be practised with advantage; but of this Dr. Cullen tells us he has had no experience: and the benefit of the practice is not, so far as we know, confirmed by the observation of any other practitioner.

Exercise and abstinence are the means of avoiding the plethoric state which gives the disposition to the gout; and are therefore the means proposed for preventing the paroxysms, or at least for rendering them less frequent and more moderate. But many circumstances prevent the steadiness necessary in pursuing these measures: and therefore, in such cases, unless great care be taken to avoid the exciting causes, the disease may frequently return; and, in many cases, the preventing of paroxysms is chiefly to be obtained by avoiding those exciting causes already enumerated.

A due attention in avoiding these different causes will certainly prevent fits of the gout; and the taking care that the exciting causes be never applied in a great degree, will certainly render fits more moderate when they do come on. But, upon the whole, it will appear, that a strict attention to the general conduct of life, is in this matter necessary; and therefore, when the predisposition has taken place, it will be extremely difficult to avoid the disease.

Dr. Cullen is firmly persuaded, that, by obviating the predisposition, and by avoiding the exciting causes, the gout may be entirely prevented; but, as the measures necessary for this purpose will, in most cases, be pursued with difficulty, and even with reluctance, men have been very desirous to find a medicine which might answer the purpose without any restraint on their manner of living. To gratify this desire, physicians have proposed, and, to take advantage of it, empirics have feigned, many remedies. Of what nature several of these remedies have been, it is difficult to say: but of those which are unknown, we conclude, from their having been only of temporary fame, and from their having soon fallen into neglect, that they have been either inert or pernicious, and therefore shall make no inquiry after them, farther than to mention one or two known remedies for the gout which have been greatly in vogue.

One of these is what has been named in England the *Portland powder*, (see that Article.)

Another remedy which has had the appearance of preventing the gout, is an alkali in various forms; such as the fixed alkali, both mild and caustic, lime-water, soap, and absorbent earths; and of late the *soda water* (see Acidulous Waters) has been more employed than any other. When fixed alkali is

preferred, the *aqua kali* of the London Pharmacopœia may be exhibited in the dose of from twenty to forty or sixty drops twice a day in a cup of water gruel. Since it became common to exhibit these medicines in nephritic and calculous cases, it has oftened happened that they were given to those who were at the same time subject to the gout; and it has been observed, that under the use of these medicines, gouty persons have been longer free from the fits of their disease. That, however, the use of these medicines has entirely prevented the returns of gout, Dr. Cullen does not know; because he never pushed the use of them for any long time, being apprehensive that they might produce a hurtful change in the state of the fluids.

As the preventing the gout depends very much on supporting the tone of the stomach, and avoiding indigestion; so costiveness, by occasioning this, is very hurtful to gouty persons. It is therefore necessary for such persons to prevent or remove costiveness, and that by a laxative medicine, when needful; but it is at the same time proper, that the medicine employed should be such as may keep the belly regular, without much purging. Magnesia, oleum ricini, or flowers of sulphur, may be employed, as the one or the other may happen to be best suited to particular persons, but aloes or rhubarb are still better. Thus, the end may be answered by some of the following, from the Pharmacopœias of Guy's, St. Thomas's, and Bartholomew's Hospitals, in London:

℞ Vini aloes ℥iv.
Syrupi papaver. alb. ℥ss.
Salis cornu cervi ℈ij. Misce fiat Mistura.
Detur cochleare unum nocte.

℞ Saponis ℈j.
Rhabarb. in pulv. trit. gr. v.
Misce fiat Bolus ter quotidie sumendus.

℞ Aloes succot. pulv. ʒij.
Extracti glycyrrhizæ incis. ʒvj.
Spiritus vinosi tenuioris,
Aquæ puræ, sing. ℥iv.
Digere in calore arenæ per horas xij. subinde agitans; dein seponatur et postquam fœces subsiderint, effundatur liquor purus et filtretur reliquus.
Dosis, a drachmâ ad unciam, horâ somni.

Or the following, known by the name of *Boerhaave's Gout Cordial:*

℞ Rhabarb. in pulv. trit. ℥j.
Fol. sennæ, ʒij.
Sem. Cardam. } contus. sing. ʒj.
Sem. Coriand. }
Croci

Coccinellæ, sing. ℈ij.
Uvæ pass. ℥iij.
Sp. Vini Gall. lib. j.
Digere et cola. Detur cochl. iv. pro re natâ.

Dr. Saunders directs the administration of Oleum Ricini in the following way:

℞ Ol. e semin. ricini,
Vitell. Ovi recent. sing. ℥ss.
His rite terendo subactis, adde paulatim,
Aq. cinnam. vel
Aq. Menth. pip. ℥iss.
Fiat Haustus quamprimum sumendus.

Or the following preparation of Rhubarb from the same, may be properly employed in gouty cases:

℞ Rhabarb. in pulv. trit.
Magnes. ust. utriusq. ʒij.
Cinnam. cort. contus. ʒj.
Aquæ ferventis ℥x.
Magnesia et rhabarbaro prius ritè contritis, in vase idoneo macera, et liquorem cola; dein adde
Tincturæ cort. aurant. ℥j.
Sumantur coch. iij. hora ante prandium quotidie.

These are the several measures to be pursued in the intervals of the paroxysms; and we are next to mention the measures proper during the time of them.

As during the existence of paroxysms the body is in a feverish state, no irritation should then be added to it; every part, therefore, of the antiphlogistic regimen, *except the application of cold,* ought to be strictly observed. Another exception to the general rule may occur when the tone of the stomach is weak, and when the patient has been before much accustomed to the use of strong drink; for then it may be allowable, and even necessary, to give some animal food and a little wine.

That no irritation is to be added to the system during the paroxysms of gout, except in the cases mentioned, is agreed upon among physicians: but it is a more difficult matter to determine, whether, during the time of paroxysms, any measures may be pursued to moderate the violence of reaction and of inflammation. Sydenham has given it as his opinion, that the more violent the inflammation and pain, the paroxysm will be the shorter, as well as the interval between the present and the next paroxysm longer; and, if this opinion be admitted as just, it will forbid the use of any remedies which might moderate the inflammation; which is, to a certain degree, undoubtedly necessary for the health of the body. But on the other hand, acute pain presses for relief; and although a certain degree

of inflammation may seem absolutely necessary, it is not certain but that a moderate degree of it may answer the purpose; and it is even probable, that in many cases the violence of the inflammation may weaken the tone of the parts, and thereby invite a return of paroxysms. It seems to be in this way, that, as the disease advances, the paroxysms become more frequent.

From these last considerations, it seems probable, that, during the time of paroxysms, some measures may be taken to moderate the violence of the inflammation and pain, and particularly, that, in first paroxysms, and in the young and vigorous, blood-letting at the arm may be practised with advantage: but this practice cannot be repeated often with safety; because blood-letting not only weakens the tone of the system, but may also contribute to produce plethora. However, bleeding by leeches on the foot, and upon the inflamed part, may be practised and repeated with greater safety; and instances have been known of its having been employed with safety to moderate and shorten paroxysms; but how far it may be carried, we have not had experience enough to determine.

Besides blood-letting and the antiphlogistic regimen, it has been proposed to employ remedies for moderating the inflammatory spasm of the part affected, such as warm bathing and emollient poultices. These have sometimes been employed with advantage and safety; but, at other times, have been found to give occasion to a retrocession of the gout.

Blistering is a very effectual means of relieving and discussing a paroxysm of the gout; but has also frequently had the effect of rendering it retrocedent. The stinging with nettles is analogous to blistering; and probably would be attended with the same danger. The burning with moxa, (see Moxa) or other substance, is a remedy of the same kind; but though not found hurtful, there is no sufficient evidence of its proving a radical cure.

Camphor, and some aromatic oils, have the power of allaying the pain, and of removing the inflammation from the part affected: but these remedies commonly make the inflammation only shift from one part to another, and therefore with the hazard of its falling upon a part where it may be more dangerous; and they have sometimes rendered the gout retrocedent.

From these reflections it will appear, that some danger must attend every external application to the parts affected during a paroxysm; and that therefore the common practice of committing the person to patience and flannel alone, is established upon the best foundation. Opiates give the most certain relief from pain; but, when given in the beginning of gouty paroxysms, it has by some been thought that they occasion these to return with greater violence. When, however, the paroxysms shall have abated in their violence, but still continue to return, so as to occasion painful and restless nights, opiates may be given with safety and advantage; especially in the case of persons advanced in life, and who have been often affected with the disease. When, after paroxysms have ceased, some swelling and stiffness still remain in the joints, these symptoms are to be discussed by the diligent use of the flesh-brush. Purging immediately after a paroxysm will be always employed with the hazard of bringing it on again.

Thus far of the *regular* gout. We now proceed to consider the management of the disease when it has become *irregular*.

5. Of the irregular Gout, we have mentioned three species, namely, the *atonic*, the *retrocedent*, and the *misplaced*.

(1.) In the *atonic* gout, the cure is to be accomplished by carefully avoiding all debilitating causes; and by employing, at the same time, the means of strengthening the system in general, and the stomach in particular.

For strengthening the system in general, Dr. Cullen recommends frequent exercise on horseback, and moderate walking. Cold bathing also may answer the purpose; and may be safely employed, if it appear to be powerful in stimulating the system, and be not applied when the extremities are threatened with any pain. For supporting the tone of the system in general, when threatened with atonic gout, some animal food ought to be employed, and the more acescent vegetables ought to be avoided. In the same case, some wine also may be necessary; but it should be in moderate quantity, and of the least acescent kinds; and if every kind of wine shall be found to increase the acidity of the stomach, ardent spirits and water must be applied. For strengthening the stomach, bitters and the Peruvian bark may be employed; but care must be taken that they be not constantly exhibited for any great length of time.

The following will answer the purpose very well:

℞ Tinct. cinchonæ comp.
Tinct. gentianæ comp. sing. ℥ij. Misce.
Detur coch. j. bis die.

The most effectual medicine for strengthening the stomach is iron, which may be employed under various preparations; but the best appears to be the rust in fine powder, which may be given in large doses. The *electuarium cinchonæ cum ferro* of Guy's Hospital, is, in this case, very suitable:

℞ Cinchonæ in pulv. trit. ℥ij.
Chamæmeli in pulv. trit. ʒiss.
Ferri rubiginis ʒj.

Syrupi simplicis q. s.
Misce fiat Electuarium.
Detur drach. ij. bis terve indies;

Or the following:

℞ Myrrhæ in pulv. trit. ʒj.
Kali præparati ʒss.
Ferri vitriolati gr. xij.
Mucilaginis arabici gummi ʒij.
Decocti glycyrrhizæ ℥vis.
Spiritus pimento ℥j.
Tere myrrham et ferrum vitriolatum cum kali et mucilagine, donec perfecte commisceantur, dein adde reliqua.
Detur cochl. ij. ad iv. bis terve indies.

For supporting the tone of the stomach, aromatics may be employed; but should be used with caution, as the frequent and copious use of them have an opposite effect; and they should therefore be given only in compliance with former habits, or for palliating present symptoms. They are indeed more proper joined with the bark. The following, from the Pharmacopœia of Guy's Hospital, is very suitable for this purpose:

℞ Confect. Aromat. ʒij.
Pulv. cinchon. ℥fs.
Aquæ menth. piper. ℥viij. Misce.

Or this from the formulæ of Dr. Nankivel:

℞ Raphan. rustic.
Sem. sinap. contus. sing. ℥ij.
Aquæ bullien. ℔ij. Fiat infusio.
Detur unc quatuor ter die.
℞ Sinap. in pulv. trit.
Cons. Rosæ sing. ℥j.
Syr. zinziber. q. s. ut fiat Electuarium.
Detur drach. j. vel ij. bis die.

When the stomach happens to be liable to indigestion, gentle vomits may be occasionally given, and proper laxatives should be always employed to obviate or to remove costiveness.

In the atonic gout, or in persons liable to it, to guard against cold is especially necessary; and the most certain means of doing this, is by repairing to a warm climate during the winter season. In northern situations, the wearing of fleecy hosiery is of great consequence, or at least flannel, universally next the skin. In the more violent cases, blistering the lower extremities may be useful; but that remedy should be avoided when any pain threatens the extremities. In persons liable to the atonic gout, issues may be established in the extremities, as in some measure a supplement to the disease.

(2.) A second case of the irregular gout, is the *retrocedent*.

When this affects the stomach and intestines, relief is to be instantly attempted by the free use of strong wines, joined with aromatics, and given warm; or, if these shall not prove powerful enough, ardent spirits must be employed, and are to be given in a large dose. In moderate attacks, ardent spirits, impregnated with garlic or with asafœtida, may be employed; or, even without the ardent spirits, a solution of asafœtida, with the volatile alkali, may answer the purpose. Opiates are often an effectual remedy; and may be joined with aromatics, as in the electuarium opiatum; or they may be usefully joined with volatile alkali and camphire. Musk has likewise proved useful in this disease, and may be given in the usual form prescribed by the London college, or in the following by Dr. Saunders:

℞ Mosch.
Castor. Russic. utriusq. in pulv. trit. ℈j.
Cons. Cynosbat. ʒj. Fiant Boli numero duo, quorum alter mane, alter vesperi sumatur, ex Misturæ camphoratæ unciis duabus.

When the affection of the stomach is accompanied with vomiting, this may be encouraged, by taking draughts of warm wine, at first with water, and aferwards without it; having at length recourse, if necessary, to some of the remedies abovementioned, and particularly to opiates. In like manner if the intestines be affected with diarrhœa, this is to be at first encouraged by taking plentifully of weak broth; and when this shall have been done sufficiently, the tumult is to be quieted by opiates. When the retrocedent gout shall affect the lungs, and produce asthma, this is to be cured by opiates, by antispasmodics, and perhaps by blistering on the back or breast.

When the gout, leaving the extremities, shall affect the head, and produce pain, vertigo, apoplexy, or palsy, our resources are very precarious. The most probable means of relief is, blistering the head; and, if the gout shall have receded very entirely from the extremities, blisters may be applied to these also. Together with these blisterings, aromatics, and the volatile alkali, or ether, may be thrown into the stomach.

(3.) The third case of the irregular gout is the *misplaced*; that is, when the inflammatory affection of the gout, instead of falling upon the extremities, falls upon some internal part. In this case, the disease is to be treated by blood-letting, and by such other remedies as would be proper in an idiopathic inflammation of the same parts.

Whether the translation so frequently made from the extremities to the kidneys, is to be considered as an instance of the misplaced gout, seems uncertain: but Dr. Cullen is disposed to think it some-

thing different; and therefore is of opinion, that, in the *nephralgia calculosa* produced upon this occasion, the remedies of inflammation are to be employed no farther than they may be otherwise sometimes necessary in that disease, arising from other causes than the gout.

Where the signs of inflammation are inconsiderable, and no particular circumstances seem to forbid its use, the *Bolus ad arthriticos* of Guy's Hospital may be had recourse to.

℞ Mellis gr. xxxvj.
Ol. Terebinth. gutt. x. ad xxiv. Misce, et fiat Bolus bis die sumendus.

Or the following directed by Dr. Nankivel:

℞ Sem. dauci sylvest.
Bacc. Junip. contus. sing. ℥ij.
Aquæ bullientis lib. j. Digere et cola.
Dosis unc. ij. omni nocte.

To this dissertation on the gout, taken from the works of our late learned professor, we cannot help subjoining the very uncommon case of Dr. Sam. Pye, in which the gout would seem to have been occasioned by a morbific matter, and to have been cured by the evacuation of it.

"Mr. Major Rook, surgeon and apothecary in Upper Shadwell, of about forty-five years of age, a sober, temperate man, of a good habit of body, accustomed to no disease but the gout; the returns of the fits whereof had never been more frequent than once in twelve or fourteen months, about the month of June, 1752, was seized with a very severe paroxysm of the gout. As I had known some extraordinary effects proceeding from a vegetable diet in that distemper, particularly in one gentleman, who, by a total abstinence from all manner of food except cows' milk, and that without bread, had cured himself of this disease; and who, at the time I mentioned the cafe to my friend, was in the 13th year his milk diet; I persuaded Mr. Rook to try what vegetables would do for him; he readily complied, and entered upon it immediately, with a resolution, that, if it auswered his expectation, he would renounce fish and flesh for ever.

"But after the most religious abstinence from animal food of every kind for eleven weeks, being visited by a gentle attack in both feet, he returned immediately to his animal food. This paroxysm continued but forty-eight hours; but in March, 1723, was succeeded by a very severe one in both feet.

"The pain in his feet, heels, and ankles, increased with great violence for about ten or twelve days; till at length he was in the most extreme agonies; such as he had never felt before, and such as almost made him mad. In the height of this extremity, the pains (it is his own expression) from the feet, heels, and ankles, flew as quick as lightening directly to the calves of his legs; but remaining there not half a minute, and not in the least abating of their extreme violence (though the feet, heels, and ankles, were left entirely free from pain), from the calves, after a short stay of about half a minute, the pain ascended with the same velocity as before to both the thighs, at the same time leaving the calves of the legs free from pain; from the thighs in less than the space of one minute, and as quick as before, they arrived at the abdomen; and after giving the patient one more severe twitch in the bowels, they reached the stomach: here the pains and here the fit ended, upon the patient's vomiting up about a pint and a half of a green aqueous liquor, but so extremely corrosive, that he compared it to the strongest mineral acid.

"This extraordinary crisis happened at about two in the morning: immediately after this discharge he fell asleep, and slept till seven or eight, and waked perfectly easy in every part, no signs of the distemper remaining but the swelling and tenderness of the feet; both of which went off gradually, so that in two days he was able to walk about his business.

"The next fit seized him in February, 1754, in the common way; but was less violent than the former, and continued for about six weeks; during which time he had three increased paroxysms, or distinct smart fits, which held him about two hours each; in the last of which he had the same critical discharge, by vomiting of the same corrosive matter, preceded by the same uncommon symptoms as in the fit of 1753. But mending every hour, he was able the very next day to walk, and attend his patients, with more ease than after the firstmentioned fit; for the swelling abated much sooner, and in three days disappeared.

"I have said, that this last fit was attended with three distinct paroxysms, the last of which ended as above: yet to show the disposition of nature, in this case, to throw off the offending humour in this her new way, it is remarkable, that in the two first of these increased paroxysms of pain, the patient declared to me, that he never had the least ease till he had vomited; but as there was no translation of the pain before these vomitings, there was none of that corrosive matter to be discharged; nothing but the common contents of the stomach was to be seen. These vomitings, however, procured the patient some ease; but the fit of the gout went on till the third paroxysm was over, which ended as has been related.

"As the crisis in this case is uncommon, I must take notice of a symptom or two, which were no less extraordinary, in both these fits of the gout.

"A most profuse sweat attended the patient every morning during the whole course of the fits;

which was so very offensive, and at the same time his breath so uncommonly stinking, that neither the patient himself, nor those who waited on him, were ever sensible of the like.

"His linen was tinged as with saffron; and his urine very high coloured, of almost as deep a red as claret: but, upon the critical vomitings, every one of these symptoms disappeared with the disease.

"On the 9th of December, 1755, he was attacked again in one foot. The symptoms, however, were so very mild, that he took no notice of them to his family till the 12th: from that day the pain was aggravated, and the swelling greatly increased, by walking, and riding in a coach. On the 17th it became extremely violent, particularly in the heel; when it instantaneously left the parts affected, and in the same manner and with equal velocity (as in the two former fits), it flew into the calves of his legs, thighs, and abdomen; and when it had reached the stomach, it caused him to vomit the same kind of corrosive acid as in the two former fits; and though the quantity was no more than a tea-spoonful, he became perfectly well in two days.

"The same symptoms of fetid urine, and offensive sweats, attended the patient in this short paroxysm as in those of 1753 and 1754: the sweat continued but two nights, and the urine fetid only forty-eight hours.

"As Mr. Rook had experienced so great and happy effects from the former critical vomitings, he was greatly disappointed upon finding the quantity evacuated so very small; for which reason he immediately attempted to increase it, by drinking three pints of warm water (which was at hand), but in vain; for neither that, nor the use of his finger, could provoke to an evacuation, which was begun and finished by nature: for though the quantity evacuated was so very small, yet as it was equally corrosive, and produced the same effect, the discharge must be accounted as truly critical as the others were.

"During the first of these fits, in the year 1752, a hard tumour had appeared on the side of the metatarsus near the middle of the right foot, which continued till after the third critical vomiting; when it was resolved, and totally disappeared, upon the discharge of a viscid matter like the white of an egg, with a few small chalk-stones from the end of the middle toe of the same foot. This discharge happened about four or five days before the patient was seized with a regular fit in April, 1755. But it is to be remarked, that this last fit continued three or four weeks, and went off in the common way, without any of the critical discharges of vomiting, urine, or sweat; but left on one hand three, and on the other two, fingers loaded with chalk-stones; with this peculiar symptom, that when the weather was cold, those fingers were affected with a most exquisite pain, which was always removed by heat.

"But not long after this lastmentioned fit, a large quantity of chalk-stones were extracted from the bottom of the left foot, near the ball of the great toe, and that from time to time for about three or four months. On the 19th of January, 1756, (the wound occasioned by the chalk-stones being still open), he was seized with a fever, without any symptom of the gout; the fever went off on the third day, with the same kind of critical sweat and urine as always accompanied the acid vomitings in the forementioned fits. On the fourth day from the attack of the fever, a fit of the gout came on, with the common symptoms, in both feet; which continued with violence for about a week, with frequent retching and vomiting, but without bringing up more than the common contents of the stomach. At this time an uncommon itching in the bottom of the foot and ball of the great toe from whence the chalk-stones had been extracted, tormented the patient for five or six hours; upon his gently rubbing the part, he was very sensible of a fluctuation of some matter, which soon appeared to flow at first in small quantities from the open orifice in the ball of the toe: upon pressing the part, about a tea-cupfull of a liquid chalky matter was collected. The next morning the patient made a large opening with an imposthume knife, which produced more than half a pint of bloody serous matter, full of chalk-stones, which proved as truly critical as the vomitings of the corrosive acid did in the cases abovementioned; for the orifice from whence the chalk-stones first issued was very soon healed, and the gentleman continued in perfect health."

ARTHRO'DIA, (from αϑϱοω, to articulate); a species of *diarthrosis*, or moveable connexion of bones, in which the head of one bone is received into the superficial cavity of another, so as to admit of motion in every direction. The head of the humerus, within the glenoid cavity of the scapula, is an instance.

ARTHRODY'NIA (*arthrodynia*, from αϱϑϱον, a joint, and αδυνη, pain); chronic pains in the joints, without pyrexia. It is one of the terminations of the acute rheumatism. See RHEUMATISMUS.

ARTICHOKE. See CINARA.

ARTICHOKE, FRENCH. See CINARA.

ARTICHOKE, JERUSALEM, an esculent plant, formerly in estimation for the table. It is the *Helianthus tuberosus* of Linn. now neglected, as being apt to produce flatulency and dyspepsia in weak stomachs.

A'RUM, (from the Hebrew word JARON, which signifies *a dart*, so named because its leaves are shaped like a dart; or from αϱα, *injury*); common ARUM, or WAKE-ROBIN. It is the *arum*

maculatum Linn. *Arum acaule, foliis hastatis integerrimis, spadice clavato.* Class, *Gynandria.* Order, *Polyandria.* It is a low perennial plant, grows wild under hedges, and by the sides or banks in shady places. In March it sends out two or three leaves shaped like a spear, a naked stalk follows these, which bears a purplish pistil inclosed in a long sheath, followed, in July, by a bunch of red berries. Some of the plants have leaves that are spotted black, others with white, and others have none. The black spotted kind are the strongest of all the three. Those that grow in moist shades are stronger than those that grow in dry exposed places.

The root is irregularly round, tuberous, about an inch thick, sending off many long simple fibres; and in the medicinal part of this plant it is brown on the outside, and white within. It is acrid and pungent to the taste. If chewed, the tongue will be affected with a burning sensation, which continues for some hours, but may soon be relieved with a little milk. The firm, hard, roots should be chosen. They lose too much by drying to be worth keeping, for by heat they become a bland farinaceous aliment; but a syrup made with them would keep as well as the syrup made of garlic does. They afford nothing by distillation nor infusion; yet if buried in fresh sand they will keep very well for several months, provided that they are kept just moist only; and in every season they are in full virtue alike. *Bergius* considers this root as stimulant, aperient, and diuretic. And indeed the more ancient writers speak highly of it, both as an internal and external remedy. It most powerfully attenuates, and resolves the thick viscid mucus of the stomach, and that adhering to the sides of the intestines. Bergius considers it as useful in loss of appetite, sympathetic head-ach (in which last, though of the most violent kind, the powder has been successful when the case had resisted every other means), humoral asthma, and intermittent fever. Arum is certainly a very powerful stimulant, and by promoting the secretions may be advantageously employed in cachectic, chlorotic, and rheumatic affections; and in various other complaints of phlegmatic and torpid constitutions; but more especially in a weakened relaxed state of the stomach, occasioned by a viscid mucus.

Dr. Cullen says, in his Materia Medica, "This root is of a singular composition. As it is produced in the earth it contains an acrid matter which is not to be extracted by spirit of wine, and is not, therefore, an essential oil. Though this acrid matter gives out no odour, its acrimony readily passes off in drying, and exhales under decoction in water; but it does not rise with either water or spirit in distillation, so as to give any impregnation to the distilled liquor.

"Besides this acrid matter, which is in small proportion to the whole, the root consists of a farinaceous and nutritious matter: it is, therefore, the acrid matter only that renders it an active medicine. The acrimony of it appears in the application of the fresh root to the skin; which, if delicate, is reddened by it, and some blistering is excited: but in this respect it is not so inflammatory as several other substances of the same class. Taken internally, it stimulates the stomach, and excites the activity of the digestive powers when they happen to be languid; and we have this proof of its stimulating the whole system, that, like other stimulants, it has been useful in intermittent fevers."

As a warm stimulant it may be given, mixed with a mucilage of gum-arabic. The dose of the fresh root is from gr. x. to ℈j. The root answers quite as well as garlic, for cataplasms to be applied on the feet in deliriums, &c. as Cullen has observed. The London College, in their Pharmacopœia of 1788, ordered the following formula.

Conserva Ari. Lond.

Take of the fresh root of wake-robin, bruised, half a pound;
Clarified sugar, one pound and a half;
Beat them together in a mortar. The dose is one drachm.

A'RUM MACULA'TUM; the systematic name for the *arum* of the Pharmacopœias. See ARUM.

ASARABA'CCA. See ASARUM.

A'SARUM, (from the Greek α, neg. and σαιρω, *to adorn;* because it was not admitted into the ancient coronal wreaths); the herb ASARABACCA. *Asarum europæum* Linn. *Asarum foliis reniformibus obtusis binis.* Class, *Dodecandria.* Order, *Monogynia.* Nat. Ord. *Sarmentaceæ.* Of this genus there are three species:—1. The *Europeum.* 2. The *Canadense.* 3. The *Virginicum.* The first species grows naturally in some parts of England. It has thick fleshy jointed roots; the leaves grow singly upon short foot-stalks, which arise immediately from the root. The flowers grow upon very short foot-stalks close to the ground, so are hid under the leaves. They have a bell-shaped empalement, of a worn-out purple colour, which is cut in three at the top, where it turns backward. It prefers a moist shady place, and may be propagated by parting the roots in autumn. The two latter species have no remarkable properties; but the former has been applied to medicinal uses. The dried roots of this plant have been generally brought from the Levant; those of our own growth being supposed weaker in their qualities.

Both the roots and leaves have a nauseous, bitter, acrimonious, hot taste; their smell is strong, and not very disagreeable. Given in substance from half a drachm to a drachm, they evacuate powerfully both upwards and downwards. It is said, that tinctures made in spirituous menstrua, possess both the emetic and cathartic virtues of the plant; that the extract obtained by inspissating these tinctures, acts only by vomit, and with great mildness; that an infusion in water proves cathartic, rarely emetic; that aqueous decoctions made by long boiling, and the watery extract, have no purgative or emetic quality, but prove notable diaphoretics, diuretics, and emmenagogues.

The principal use of this plant among us is as a sternutatory. The root of asarum is perhaps the strongest of all vegetable errhines, white hellebore itself not excepted. Snuffed up the nose, in the quantity of a grain or two, it occasions a large evacuation of mucus, and raises a plentiful spitting. The leaves are considerably milder, and may be used to the quantity of three, four, or five grains. Geoffroy relates, that after snuffing up a dose of this errhine at night, he has frequently observed the discharge from the nose to continue for three days together; and that he has known a paralysis of the mouth and tongue cured by one dose. He recommends this medicine in stubborn disorders of the head arising from a defective secretion, in palsies, and in soporific diseases.

The only officinal preparation of this plant is the Pulv. asar. comp. *Edin. Lond. Dubl.*

ASARUM EUROPEUM; the systematic name for the *asarum* of the pharmacopœias. See ASARUM.

ASBESTOS, or ASBESTUS, (ασβεστος), a genus in the order of fibrous stones; its fibres are hard, rigid, and brittle, when separated; and are not so easily divisible as those of the *amianthus*. See AMIANTHUS.

ASCALONITES, (from *Ascalon*, a city of Judea, where they grow abundantly), escallions, or scallions, a variety of onions.

ASCALONITIDES, eschalots, barren onions, or scallions.

ASCARIS, a genus of insects belonging to the order of vermes intestina. The body of the ascaris is cylindrical, filiform, and tapers at both ends. The species are two, *viz.*

1. *Vermicularis*, the *thread* or *maw-worm*, the essential character of which Dr. Hooper describes to be "the head obtuse, and furnished with three vesicles, and the tail terminating in a sharp point."

When full grown it is about half an inch in length, and in thickness resembling a fine piece of thread. Its head, or obtuse extremity, is nodose, and divided into three vesicles or papillæ, in whose middle is an aperture, through which the worm takes its nourishment. The body forms about a third part of the whole length of the animal, beginning immediately from the head, and terminating in the tail. It is of a rugose, pellucid, annular fabric. The tail commences where the body ends, gradually becoming less, and terminating like a cobler's awl, in a fine point. When viewed with a glass, it appears subulated, and furnished with rugæ or thick firm annuli; and there is a small aperture at its beginning, through which the fæces are excreted.

These worms are most commonly situated in the intestinum rectum of children, and are continually passing *per anum;* hence they are called by the Germans *afterwurm.* They are also frequently met with in the cæcum and colon, and have been found in the stomach and small intestines, lying hidden between their folds. Horses are likewise infested with this kind of worm. They not unfrequently creep round from the *anus* to the vulva in women, and Dr. Hooper says, he has known them inhabit the vagina and uterus. Anatomical investigations after death, have also exposed them in the bladder and urinary passages.

The vermicular ascarides exist generally in very considerable numbers, especially in the rectum of children. When they inhabit other parts, their numbers are less considerable, yet upwards of an hundred have been vomited in the course of a day, in some instances.

Their natural colour is a pale yellow; but they have been often observed of a yellowish green, and occasionally brown. This would appear to depend upon a variety of circumstances with which we are unacquainted; for, if suffered to remain a day or two in water, they always (whatever their colour may be) become of an opaque pale yellow.

The head is the part first put into motion, which the animal turns in every direction, sometimes forming a circle, at other times the figure of 8; but most frequently its tail appears fixed, whilst it turns its body sometimes to one side, and then to the other. They are extremely vivacious, and have been seen to bury themselves in the soft fæces of children almost instantaneously upon exposure to the atmospheric air. By some they are said to jump from one place to another, like worms in cheese; but this is doubtful.

The vermicular ascarides are not, as is the generally received opinion, hermaphrodite; for the male and female are distinct worms. The former when exposed to the magnifying glass, does not exhibit any of the gyrated apparatus, which, in the female, is decidedly for the purpose of bringing the young to perfection. The stomach and intestinal canal have, apparently, a different arrangement from those of the female, and are the only viscera which Dr. Hooper has been able to detect. He searched for the male organs of generation, but has never been able to find them. Perhaps they

are so very minute as to elude all research. The female has, upon its external surface, about the eighth of an inch from the head, a small punctiform aperture through which the young are protruded. When the worm is very much magnified, its external cavity appears filled with the convoluted apparatus; and upwards of an hundred of the young have been seen to escape through the external aperture, all alive, and very vivacious, several hours after the death of the mother, upon a slight pressure being made with the finger.

On the anatomical structure of these creatures Dr. Hooper makes the following ingenious observations:

"The integuments of this species," says he, "are similar to those of the lumbricoid ascaris, and consist of cuticle, cutis, and, as far as I can discover, only one set of annular muscles. I have never been able to detect any longitudinal lines upon its external surface.

"The cavity in which the viscera are situated, begins at a very small distance from the head, and terminates where the tail commences; at which place there is a small opening, which is the extremity of the intestinal canal.

"The only *viscera* in the *male* worm are the œsophagus, stomach, and intestine. The *œsophagus* begins at the mouth, gradually enlarges for a small space, and terminates in the stomach. The *stomach* is a somewhat round bag, situated at the extremity of the œsophagus, so that, both together, they are pistilliform, that is, resembling an apothecary's glass pestle, which, according to Goeze, constitutes a distinguishing character of this species. The stomach evacuates its contents into the *intestinal canal*, which is continued through the worm, more or less contracted or dilated, until it terminates in the anus. The contents of the stomach and intestinal tube are always of the same colour, a dark brown.

"The *female* worm has (besides the viscera described) an apparatus subservient to generation. It begins by a slender tube leading from the small punctiform opening or pudenda, situated nearly in the middle of the body of the worm. It soon becomes much larger, embraces the intestinal tube in every direction, and fills up the cavity of the worm. This gyrated uterus is not bifurcated as in the ascaris lumbricoides, nor has it those filiform appendages. Its end or fundus is as large as any other part. When viewed with the microscope, it appears like a bladder distended with worms, for its young are distinctly seen moving about from one end to the other.

2. The *lumbricoides*, is about the same length with the lumbricus terrestris, or common earthworm; but it wants the protuberant ring towards the middle of the body, the only mark by which they can properly be distinguished. The body of the lumbricoides is described by authors to be cylindrical, and subulated at each extremity; but the tail somewhat triangular. The lumbricoides is the worm which is most commonly found in the human intestines. It is viviparous, and produces vast numbers. For a more particular account of this species see LUMBRICOIDES; and for the method of expelling worms see ANTHELMINTICS.

ASCI'TES, (from ἀσκός, a sack or bottle), DROPSY of the belly; a tense, but scarcely elastic, swelling of the abdomen from the accumulation of water within. Dr. Cullen ranks this genus of disease in the class *cachexiæ*, and order *intumescentiæ*. He enumerates two species: 1. *Ascites abdominalis*, when the water is in the cavity of the peritonæum, which is known by the equal swelling of the parietes of the abdomen. 2. *Ascites saccatus*, or encysted dropsy, in which the water is encysted, as in the ovarium: the fluctuation in the latter is less evident, and the swelling at first only partial.

1. In the beginning of an ascites the patient becomes languid, breathless, and has an aversion to motion; his belly swells; and when struck, the sound of fluctuating water is perceptible; there is a difficulty of breathing when the belly is pressed. There is an almost continual thirst, which in the progress of the disease becomes very urgent; the urine is thick, in small quantity, and red. The pulse is small and frequent; and as the belly swells, the other parts waste away. A fever at last arises, which, constantly increasing, in the end carries off the patient. These symptoms are most urgent where the waters are in immediate contact with the intestines; in the other kinds the rest of the body is less wasted; nor is there so great a thirst or difficulty of breathing.

2. The immediate cause of dropsy is a greater effusion of serum by the exhalant arteries than the absorbents take up. This may be occasioned either by too great a quantity of liquid thrown out by the former, or by an inability of the latter to perform their office. This commonly happens in people whose bodies are of a weak and lax texture, and hence women are more subject to this malady than men; chlorotic girls especially are very apt to become dropsical.

Sometimes, however, this disease is occasioned by a debility of the vital powers, by great evacuations of blood, or by acute diseases accidentally protracted beyond their usual period; and although this cause seems very different from a laxity of fibres, yet the dropsy seems to be produced in a similar manner by both. For the vital powers being debilitated by either of these causes, naturally bring on a certain debility and laxity of the solids; and on the other hand a debility of the solids always brings on a debility of the vital powers; and from this debility of the vital powers, in both cases, it happens, that those humours which ought

to be expelled from the body, are not, but accumulate by degrees in its cavities. There is, however, this difference between the two kinds of dropsy, arising from these two different causes:—that in the one which arises from laxity, the solid parts are more injured than in that which arises from a debility of the vital powers. In the former, therefore, the water seems to flow out from every quarter, and the body swells all over. But when the disease is occasioned by a debility of the vital powers, though the solids be less affected, yet the power of the heart being much diminished, and the humours scarce propelled through the extreme vessels, the thin liquids by which, in a healthy state, the body is daily recruited, are carried by their own weight either into the cavities or into the cellular texture. Hence those aqueous effusions which follow great evacuations of blood, or violent loosenesses, begin in the more depending parts of the body, gradually ascending, till they arrive at the cavity of the abdomen, or even the thorax.

But another and much more sufficient cause for the production of dropsy, is an obstruction of the circulation; and this may take place from polypi in the heart or large vessels, and hard swellings in the abdomen. Instances have been observed of a dropsy arising from steatomatous tumours in the omentum, and many more from a scirrhous liver or spleen, and from an infarction and obstruction of the mesenteric glands, by which means the lymph coming from the extremities is prevented from arriving at the heart. Scirrhosity of the liver, the most common cause of ascites, probably operates by augmenting effusion in consequence of its preventing the return of the venous blood, the greater part of the veins from the abdomen going to the formation of the vena portarum.

Lastly, whatever, either within or without the vessels, contracts or shuts up their cavities, produces a more copious and easy transmission of the thin humours through the exhalant arteries, at the same time that it prevents their return by the absorbent veins. This has been established by experiment; for Lower having perforated the right side of the thorax in a dog, tied the *vena cava*, and sewed up the wound. The animal languished for a few hours, and then died. On dissection, a great quantity of serum was found in the abdomen, as if he had long laboured under an ascites. In like manner, having tied the jugular veins of another dog, a surprising swelling took place in those parts above the ligatures, and in two days the creature died. On dissection, all the muscles and glands were vastly distended, and quite pellucid, with limpid serum. From these experiments, and some cases of the disease mentioned by different authors, it appears, that when the veins are obstructed so that they cannot receive the arterial blood, the serum is separated, as by a filtre, into the more open cavities and laxer parts of the body, while the thicker part stagnates, and is collected in the proper blood vessels.

The too great tenuity of the humours is very frequently deemed the cause of dropsy, and many authors have asserted that dropsy might arise merely from a superabundance of water in the blood. For this, some experiments are quoted, from which they would infer, that when a great quantity of aqueous fluid is introduced into the blood, the superfluous fluid ought by no means to pass through the extremities of the sanguiferous arteries into the veins, in the common course of circulation, but by being effused into the cavities should produce a dropsy. But this can only happen when the vital powers are very much diminished; for, in a natural state, the superfluous quantity is immediately thrown out by the skin or the kidneys: and agreeable to this we have an experiment of Schultzius, who induced a dropsy in a dog by causing him to drink a great quantity of water; but he had first bled him almost *ad deliquium*, so that the vital powers were in a manner oppressed by the deluge of water. In this manner do those become hydropic who are seized with the disease on drinking large quantities of water, either when wearied with labour, or weakened by some kinds of disease. Dr. Fothergill relates an instance of a person who, being advised to drink plentifully of barley-water, in order to remove a fever, rashly drank twelve pounds of that liquor every day for a month, and thus fell into an almost incurable distemper. But if this quantity had been taken only during the prevalence of the fever, he would in all probability have suffered no inconvenience, as is probable from what has been related concerning the *diæta aquea* used by the Italians.

It is, moreover, evident from experiments, that, in a healthy state, not only water is not deposited in the cavities, but that if it is injected into them it will be absorbed, unless some laxity of the solids has already taken place. Dr. Musgrave injected into the right side of the thorax of a dog four ounces of warm water; whence a difficulty of breathing and weakness immediately followed. But these symptoms continually lessened, and in the space of a week the animal seemed to be in as good health as before. Afterwards he injected sixteen ounces of warm water into the left cavity of the thorax in the same dog; the same effects followed, together with great heat, and strong pulsation of the heart; but he again recovered in the space of a week. Lastly, he injected eighteen ounces of water into one side of the thorax, and only six into the other: the same symptoms followed, but vanished in a much shorter time; for within five days the dog was restored to perfect health. During this time, however, he observed that the creature made a greater quantity of urine than usual.

The remote causes of dropsy are many and various. Whatever relaxes the solids in such a manner as to give an occasion of accumulation to the serous fluids, disposes to the dropsy. A lazy indolent life, rainy wet weather, swampy or low soil, and every thing which conduces to weaken the viscera, or insensibly to produce obstructions in them, paves the way for a dropsy. Hence those are ready to fall into the disease who use hard and viscid aliments, such as poor people, in some countries, who use coarse brown bread, and children who are fed with unwholesome aliments; and the same thing happens to those who drink immoderately of spirituous liquors.

3. When the dropsy arises from a scirrhus of the liver or spleen, or any of the other viscera, the prognosis must always be unfavourable, and also when it arises from disorders of the lungs. Neither is the case more favourable to those in whom the small vessels are ruptured, and pour out their liquids into the cavity of the abdomen. Those certainly die who have polypi in the vessels, or tumors compressing the veins and vessels of the abdomen. A dropsyarising from obstructions in the mesenteric glands is likewise difficult to cure, whether such obstructions arise from a bad habit of body, or from any other cause; if we can, however, by any means remove the disease of the glands, the dropsy easily ceases. But in those who fall into dropsy without any disease preceding, it is not quite so dangerous; and even though a disease has preceded, if the patient's strength be not greatly weakened, if the respiration be free, and the person be not affected with any particular pain, we may entertain great hopes of a cure. But where a great loss of blood is followed by a fever, and that by a dropsy, the patients almost always die, and that in a short time: those, however, are very frequently cured who fall into this disease without any preceding hemorrhagy.

4. In the cure of this disease authors chiefly mention two indications. (1). To expel the superfluous quantity of water; and (2). To prevent its being again collected.

But before we proceed to speak of the remedies, it is necessary to take notice, that by the animal economy, if a great evacuation of a fluid takes place in any part of the body, all the other fluids in the body are directed towards that part; and those which lie, as it were, lurking in different parts, will be immediately absorbed, and thrown out by the same passage. Hence the humours, which in hydropic persons are extravasated into the different cavities of the body, will be thrown into the intestines, and evacuated by purgatives; or by diuretics will be thrown upon the kidneys, and evacuated by urine. It is, however, not only necessary to excite these evacuations in order to remove this malady, but they must be assiduously promoted and kept up till the abundant fluid is totally expelled. For this reason Sydenham has advised purgatives to be administered every day, unless, either through the too great weakness of the body, or the violent operation of the purgative, it shall be necessary to interpose a day or two now and then; because if any considerable intervals be allowed to take place between the exhibition of the purgatives, an opportunity is given to the waters of collecting again. In this method, however, there is the following inconvenience, that, when the waters are totally evacuated, the strength is at the same time so much exhausted, that the disease commonly returns in a very short time. Hence almost our only hopes of curing a dropsy, consist in gently evacuating the waters by means of diuretics. But the efficacy of these is generally very doubtful. Dr. Freind has long ago observed, that this part of medicine is, of all others, the most lame and imperfect; but a French physician, Mr. Bacher, discovered, as he alleges, a method of making the diuretics much more successful. His reputation in this way became so great indeed, that the French king thought proper to purchase his secret for a great sum of money. The basis of his medicine was hellebore root, the offensive qualities of which he attempted to correct in the following manner. A quantity of the dried roots of black hellebore were pounded, and then put into a glazed earthen vessel, and afterwards sprinkled with spirit of wine. They were suffered to stand for twelve hours, stirring them about twice or thrice during that space of time. They were then sprinkled again, and at last good Rhenish wine was poured on till it stood six fingers above the roots. The mixture was frequently agitated with a wooden spatula; and as the wine was imbibed by the roots, more was poured on, so as to keep it always at the same height for forty-eight hours. The whole was then put on the fire and boiled for half an hour, after which the decoction was violently pressed out; the same quantity of wine was added as at first, and the mixture boiled as before. After the second expression the woody residuum was thrown away as useless. Both the strained liquors are then mixed together with two parts of boiling water to one of the decoction. The whole is afterwards evaporated in a silver vessel to the consistence of a syrup. One part of the extract is again added with two parts of boiling water, and the whole inspissated as before. By this means, says he, the volatile nauseous acrid particles are separated by evaporation, and the fixed ones remain corrected and prepared for medicinal uses; adding, towards the end, a ninth part of old brandy, and evaporating to the consistence of turpentine. Mr. Bacher reasons a good deal on the way in which this process corrects the medicine; but tells us, that notwithstanding the improvement, his pills will not have the desired effect unless properly made up.

For forming them, they ought to be mixed with matters both of an inviscating and indurating nature; yet, so prepared that it will be readily soluble in the stomach, even of a person already debilitated. For answering these purposes, he chose myrrh and carduus benedictus, and then gives the following receipt for the formation of his pills.

Pilulæ Tonicæ.

Take the Extract of hellebore, prepared as above directed;
Solution of myrrh, of each one ounce;
Carduus benedictus, in powder, three drachms and a scruple.
Mix them together, and form into a mass; dividing it into pills of a grain and a half each.

To these pills Mr. Bacher gives the name of the *pilulæ tonicæ*, from an idea, that while they evacuate the water, they at the same time act as tonics; and that, from augmenting the action of the lymphatics, they prevent the return of the disease. Indeed, if both these intentionscould be effectually answered by the use of the same remedy, it would unquestionably be of great importance in practice.

The effects of these pills were, we are told, very surprising. Dr. Daignan relates, that he gave them to eighteen hydropic patients at once; and these he divided into three classes, according to the degree of the disease with which they were affected. The first class contained those who laboured under an anasarca following intermittent fevers. The second class contained those who had anasarca, together with some degree of ascites, arising from tedious febrile disorders. All these were cured; but these two classes consisted of such cases as are most easily removed. But the third contained six who were seized with a most violent anasarca and ascites after being much weakened by tedious disorders, and of consequence in whom the disease was very difficult to be cured. Even of these, however, four were cured, and the other two died. The body of one of these being dissected, both sides of the cavity of the thorax were found to be full of a blackish red water. The lungs were unsound; there was a polypous concretion in the right ventricle of the heart; the liver and spleen were hard, and of a preternatural bulk; and the glands of the mesentery were obstructed and indurated. In the other, the liver and pancreas were scirrhous, and the spleen very hard.

The same medicines were given by De Horne to eight persons, six of whom had both an anasarca and ascites, but the other two only an ascites. Four of these recovered; three died without being freed from the dropsy; one in whom the dropsy was cured died in a short time after, having for some time before his death become speechless.

By these patients ten of the pills were taken at once; and the same dose repeated to the third time, with an interval of an hour betwixt each dose. At first they proved purgative, and then diuretic; by which last evacuation they finally cured the disease. But though Mr. Bacher was firmly of opinion that his pills cured the dropsy by reason of the above-related correction; yet it is certain that, in the hands of other practitioners, these very pills have failed, unless they also made use of the same regimen recommended by that physician; while, on the other hand, it is also certain, that different medicines will prove equally efficacious in dropsical cases, provided this regimen is made use of.

For a great number of ages it has been recommended to dropsical patients to abstain as much as possible from drink, and thus to the torments of their disease was added that of an intolerable thirst; and how great this torment was we may understand from an example of a friend of king Antigonus, who, having been closely watched both by order of the physicians and also of the king, was so unable to bear the raging thirst occasioned by his disease, that he swallowed his own excrements and urine, and thus speedily put an end to his life. Dr. Milman shows at great length the pernicious tendency of this practice. He maintains that it is quite contrary to the sentiments of Hippocrates and the best ancient physicians. He asserts, that unless plenty of diluting drink be given, the best diuretics can have no effect. He condemns also in the strongest terms the practice of giving dropsical patients only dry, hard, and indigestible aliments. These would oppress the stomach even of the most healthy; and how much more must they do so to those who are already debilitated by labouring under a tedious disorder? By what means also are these aliments to be dissolved in the stomach when drink is withheld? In this disease the saliva is viscid, and in small quantity; from whence it may be reasonably conjectured, that the rest of the fluids are of the same nature, and the gastric juices likewise depraved. Thus the aliments lie long in the stomach; and if the viscera were formerly free of obstructions, these are now generated; the strength fails; perspiration and other excretions are obstructed; the viscid and pituitous humours produced by these kinds of food oppress the præcordia, and increase the disease, while the surface of the body becomes quite dry. Nay, so much does this kind of diet conspire with the disease, that 100 pounds of fluid will sometimes be imbibed in a few days by hydropic persons who take no drink. Even in health, if the body from any cause becomes dry, or deprived of a considerable part of its juices, as by hunger, labour, &c. it will imbibe a considerable quantity of moisture

from the air; so that we must impute the abovementioned extraordinary inhalation, in part at least, to the denial of drink, and to the nature of the aliment given to the sick. The following is the account given by Dr. Milman of his practice in the Middlesex hospital.

If the patient be not very much debilitated, he is sometimes treated with the purging waters, and a dose of jalap and calomel alternately. On the intermediate days he gets a saline mixture, with forty or sixty drops of *acetum scillæ* every sixth hour; drinking with the purgatives oat-gruel and some thin broths. That he might the better ascertain what share the liquids given along with the medicines had in producing a copious flow of urine, he sometimes gave the medicines in the beginning of the disease without allowing the drink: but though the swellings were usually diminished a little by the purgatives, the urine still continued scanty, and the patients were greatly weakened. Fearing, therefore, lest, by following this course, the patient's strength might be too much reduced, he then began his course of diuretic medicines, giving large quantities of barley-water with a little *sal diureticus;* by which means, sometimes in the short space of forty-eight hours after the course was begun, the urine flowed out in very large quantity: but as the saline drinks are very disagreeable to the taste, a drink was composed purposely for hydropic persons, of half an ounce of cream of tartar dissolved in two pounds of barley-water, made agreeably sweet with syrup, adding one or two ounces of brandy.

To this composition Dr. Milman was induced by the great praises given to cream of tartar by some physicians in hydropic cases. In the *acta Bononiensia*, fifteen cases of hydropic patients are narrated who were cured only by taking half an ounce of cream of tartar daily. But it is remarkable, that by these very patients the cream of tartar was taken for 20, 30, nay 40 days, often without any perceptible effect; yet when dissolved in a large quantity of water, it showed its salutary effects frequently within as many hours, by producing a plentiful flow of urine. This liquor is now the common drink of hydropic patients in the hospital abovementioned, of which they drink at pleasure along with their medicines.

Among purgative medicines, Dr. Milman recommends the *radix senekæ;* but says the decoction of it, according to the Edinburgh Pharmacopœia, is too strong, as he always found it excite vomiting when prepared as there directed, and thus greatly to distress the patients: but when only half an ounce or six drachms of the root are used to a pound of decoction, instead of a whole ounce as directed by the Edinburgh college, he finds it an excellent remedy; and though it may sometimes induce a little vomiting, and frequently a nausea, yet it seldom failed to procure nine or ten stools a-day, and sometimes also proved diuretic. But we must take care not to be too free in the use of seneka, or any other purgative, if the patients be very weak; and therefore, after having used purgatives for some time, it will be proper to depend upon diuretics entirely for perfecting the cure; and of the success of this method our author gives some very remarkable instances. But he observes, that after the dropsy is removed, the patients will sometimes die without any evident cause; and of this it is proper that the physician should be aware. It is remarkable with what ease a flux of urine is induced in those who have a scirrhous liver; while on the other hand, in one who had the mesenteric glands obstructed, along with a schirrosity of the liver and vitiated state of the lungs, the most powerful diuretics proved ineffectual. In some cases Dr. Milman thinks the kidneys may be so pressed with the weight of water, as to be unable to perform their office. With regard, however, to diuretics in general, it may be remarked, that the operation of none of them can be certainly depended upon. In particular constitutions, and at particular times, one will be observed to succeed, after another, though commonly of much greater power, has been tried in vain. Accordingly various articles of this kind are often used in succession. Recourse is particularly often had to the roots of *taraxacum*, of *colchicum*, and of *squills;* the latter, especially when combined with calomel, is often found to be a very powerful diuretic. And indeed mercury in different forms, probably from acting as a deobstruent, is often of very great use in dropsical complaints. Among other diuretics, the *lactuca virosa* has of late been highly extolled by Dr. Collins of Vienna, and the *nicotiana tabacum* by Dr. Fowler of York: but neither has been extensively introduced into practice, although we have known some instances in which the latter has been used with great advantage.

The water having been drawn off, we are to put the patient on a course of strengtheners; such as the Peruvian bark, with some of the warm aromatics, and a due proportion of rhubarb infused in wine, and chalybeates. Gentle exercise, and frictions on the belly, with such a course of diet as shall be light and nourishing, are also to be enjoined: and it may be observed, that the use of tonic medicines is by no means to be delayed till a complete evacuation of the water can be obtained. On the contrary, by alternating, and even combining the use of evacuants and tonics, the influence of both is often very much promoted.

Dr. Saunders, late Physician to Guy's Hospital, in London, speaks of the treatment in the following way. He says, the cure of dropsy chiefly de-

pends on the proper use of evacuations. The most effectual means of discharging water from the different cavities of the body, but more especially in the *Ascites*, are, (1). By purging and vomiting. (2). By the exhibition of diuretics.

Of the former description are the following formulæ :

℞ Elaterii gr. iij.
Crystal. tartar. ℈j.
Simul in pulverem tenuem terantur, et adde
Cons. Aurant. cort. q. s.
Fiat Bolus mane primo, bis in hebdomadâ, sumendus.

℞ Gambog. in pulv. trit. gr. v.
Crystal. tartar. ℈j.
Cons. Aurant. cort. q. s.
Fiat Bolus, diluculò sumendus.

℞ Pulv. ipecacuanh. g. xv.
Antim. tartar. gr. j. M. ut fiat Pulvis emeticus.
Ex pauxillo liquoris alicujus idonei vespere hauriatur, et, vomitu moto, superbibantur cyathi aliquot infusi tepidi florum chamæmeli.

℞ Pulv. rad. jallap.
Crystal. tartar. sing. ʒss.
Pulv. aromat. gr. v. misce.
Sit pulvis catharticus, mane ex sero lactis a jejuno excipiendus.

As DIURETICS, the following may be employed according to circumstances :

℞ Kali acetat. ʒij.
Aq. menth. pip. ℥iss.
Sp. lavend. comp. gutt. xxx.
Fiat haustus ter in die capiendus.

℞ Scillæ recens exsiccat. gr. iv.
Cryst. tartar. ℈j. Misce.
Sit pulvis, nocte maneque sumendus ex seri lactis poculo.

℞ Cons. scillæ ʒss.
Calomelan. gr. ij.
Opii purif. gr. ss.
Fiat bolus omni nocte per hebdomadam sumendus.

℞ Tinct. scillæ ℥j.
Dosis a guttis viginti usque ad sexaginta.

In some cases the doctor advises the following :

℞ Ammoniac. gum. in pulv. trit.
Scillæ recent. sing. ʒss.
Simul contunde, ut fiant pilulæ duodecim.
Sumat tres, bis terve quotide.

℞ Lact. ammoniac. ℥v.
Oxymel. scillæ
Tinct. opii camph. sing. ℥ss. M.
Capiat cochlearia duo, sexta quaque hora.

A remedy in dropsical cases, of late much employed, is DIGITALIS; but we have reserved, for that article, all that results from the experiments and opinions of practitioners concerning it.

When the patient can by no other means be relieved, the operation of paracentesis must be had recourse to, which is the business of the surgeon. See PARACENTESIS.

ASCLEPIADES, a celebrated ancient physician, born at Prusa in Bithynia, who flourished in the century immediately preceding the birth of Christ, and practiced at Rome, under Pompey. He introduced the philosophy of Democritus and Epicurus into medicine, and ridiculed the doctrines of Hippocrates. He asserted, that matter considered in itself was of an unchangeable nature; and that all perceptible bodies were composed of a number of smaller ones, between which there were interspersed an infinity of small spaces totally void of all matter. He thought that the soul itself was composed of these small bodies. He laughed at the principle called *nature* by Hippocrates, and also at the imaginary faculties said by him to be subservient to her; and still more at what he called *attraction*. This last principle Asclepiades denied in every instance, even in that of the loadstone and steel, imagining that this phenomenon arose from a concourse of corpuscles, and a particular disposition or modification of their pores. He also maintained, that nothing happened or was arose without some cause; and that what was called *nature* was in reality no more than *matter* and *motion*. From this last principle he inferred that Hippocrates knew not what he said when he spoke of nature as an intelligent being, and ascribed qualities of different kinds to her. For the same reason he ridiculed the doctrine of Hippocrates with regard to crises; and asserted that the termination of diseases might be as well accounted for from mere matter and motion. He maintained, that we were deceived if we imagined that nature always did good; since it was evident that she often did a great deal of harm. As for the days particularly fixed upon by Hippocrates for crises, or those on which we usually observe a change either for the better or the worse, Asclepiades denied that such alterations happened on those days rather than on others. Nay, he asserted that the crisis did not

happen at any time of its own accord, or by the particular determination of nature for the cure of disorders, but that it depended rather on the address and dexterity of the physician; that we ought never to wait till a disorder terminates of its own accord, but that the physician, by his care and medicines, must hasten on and advance the cure.—According to him, Hippocrates and other ancient physicians attended their patients rather with a view to observe in what manner they died than in order to cure them; and this under pretence that nature ought to do all herself, without any assistance.

According to Asclepiades, the particular assemblage of the various corpuscles abovementioned, and represented as of different figures, is the reason why there are several pores or interstices within the common mass, formed by these corpuscles; and why these pores are of a different size. This being taken for granted, as these pores are in all the bodies we observe, it must of course follow, that the human body has some peculiar to itself, which, as well as those of all other bodies, contain other minute bodies, which pass and repass by those pores that communicate with each other; and as these pores or interstices are larger or smaller, so the corpuscles which pass through them differ proportionably as to largeness and minuteness. The blood consists of the largest of these corpuscles, and the spirits, or the heat, of the smallest.

From these principles he infers, that as long as the corpuscles are freely received by the pores, the body remains in its natural state; and on the contrary, it begins to recede from that state when the corpuscles find any obstacle to their passage. Health therefore depends on the just proportion between the pores and the corpuscles they are destined to receive and transmit; as diseases, on the contrary, proceed from a disproportion between these pores and the corpuscles. The most usual obstacle on this occasion proceeds from the corpuscles embracing each other, and being retained in some of their ordinary passages, whether these corpuscles arrive in too large a number, are of irregular figures, move too fast or too slow, &c.

Among the disorders produced by the corpuscles stopping of their own accord, Asclepiades reckoned phrensies, lethargies, pleurisies, and burning fevers. Pains, in particular, are classed among the accidents which derive their origin from a stagnation of the largest of all the corpuscles of which the blood consists. Among the disorders produced by the bad state and disposition of the pores, he placed deliquiums, languors, extenuations, leanness, and dropsies. These last disorders he thought proceeded from the pores being too much relaxed and opened: the dropsy in particular, he thinks, proceeds from the flesh being perforated with various small holes, which convert the nourishment received into them into water. Hunger, and especially that species of it called *fames canina*, proceeds from an opening of the large pores of the stomach and belly; and thirst from an opening of their small ones. Upon the same principles, he accounted for intermittent fevers. Quotidian fevers are caused by retention of the largest corpuscles, those of the tertian kind by a retention of corpuscles somewhat smaller; and quartan fevers are produced by a retention of the smallest corpuscles of all.

The practice of Asclepiades was suited to remove these imaginary causes of disorders. He composed a book concerning common remedies, which he principally reduced to three, *viz.* gestation, friction, and the use of wine. By various exercises he proposed to render the pores more open, and to make the juices and small bodies, which cause diseases by their retention, pass more freely; and while the former physicians had not recourse to gestation till towards the end of long continued disorders, and when the patients, though entirely free from fever, were yet too weak to take sufficient exercise by walking, Asclepiades used gestation from the very beginning of the most burning fevers. He laid it down as a maxim, that one fever was to be cured by another; that the strength of the patient was to be exhausted by making him watch and endure thirst to such a degree, that, for the two first days of the disorder, he would not allow them to cool their mouths with a drop of water. Celsus also observes, that though Asclepiades treated his patients like a butcher during the first days of the disorder, he indulged them so far afterwards as even to give directions for making their beds in the softest manner. On several occasions Asclepiades used frictions to open the pores. The dropsy was one of the diseases in which this remedy was used; but the most singular attempt was, by this means, to lull phrenitic patients asleep. But though he enjoined exercise so much to the sick, he denied it to those in health; a piece of conduct not a little surprising and extraordinary. He allowed wine freely to patients in fevers, provided the violence of the disorder was somewhat abated. Nor did he forbid it to those who were afflicted with the phrenzy: nay, he ordered them to drink it till they were intoxicated, pretending by that means to make them sleep; because, he said, wine had a narcotic quality and procured sleep, which he thought absolutely necessary for those who laboured under that disorder. To lethargic patients he used it on purpose to excite them, and rouse their senses: he also made them smell strong-scented substances, such as vinegar, castor, and rue, in order to make them sneeze; and applied to their heads cataplasms of mustard made up with vinegar.

Besides these remedies, Asclepiades enjoined his

patients abstinence to an extreme degree. For the first three days, according to Celsus, he allowed them no aliment whatever; but on the fourth began to give them victuals. According to Cælius Aurelianus, however, he began to nourish his patients as soon as the accession of the disease was diminished, not waiting for an entire remission; giving to some, aliments on the first, to others on the second, to others on the third, and so on to the seventh day. It seems almost incredible to us, that people should be able to fast till this last-mentioned term; but Celsus assures us, that abstinence till the seventh day was enjoined by the predecessors of Asclepiades, and by Heraclides Tarentinus.

Dr. Burdach, of Leipsic, has published a very curious parallel between the doctrines of Asclepiades and John Brown, whose system has been so warmly received on the continent.

ASCLE'PIAS, (ασκληπιας; from Asclepias, its discoverer; or else from Æsculapius, the god of medicine); *swallow-wort;* a genus of the digynia order, belonging to the pentandria class of plants.

Of this genus there are 19 species enumerated by botanical writers; but the following are the most remarkable. 1. The *alba*, or *common swallow-wort.* The root is composed of many strong fibres connected at top like those of asparagus, from whence arise many stalks, in number proportional to the size of the roots, which grow two feet high, and are very slender at the top: the leaves are placed opposite by pairs; the flowers are white, growing in umbels near the top of the stalk, from whence are sent out smaller umbels. After the flower is past, the two germens become long pointed pods, inclosing many compressed seeds lying imbricatim, which are crowned with a soft white down. It flowers in June, and the seeds ripen in September. It is a native of the south of France, Spain, and Italy. 2. The *Syriaca*, or greater *Syrian dogsbane*, is a perennial plant, which sends up several upright stalks in the spring, about two feet high, garnished with oval leaves growing opposite; at the top of the stalks the umbels of flowers are produced, which are of a bright purple colour, making a pretty appearance, but are not succeeded by pods in England. 3. The *currassavica*, or *bastard ipecacuanha*, is a native of the warm parts of America. It rises to the height of five or six feet, with upright stems, and smooth oblong leaves placed opposite. Toward the top of the branches the umbels of flowers come out, which stand erect: the petals of the flowers are of a scarlet colour, and the horny nectariums in the middle are of a bright saffron colour, which make a pretty appearance; and there is a succession of flowers on the same plant from June to October. The flowers are succeeded by long taper pods, filled with seeds crowned with a soft down, which ripen late in autumn. The first two species are hardy; but the last one is tender, and therefore must be preserved in a stove.

Each of these has been applied to medicinal uses, but the root of the first species is preferred. It is reckoned by botanists a species of apocynum, or dogsbane; from all the poisonous sorts of which, it may be distinguished, by yielding a limpid juice, whilst that of the others is milky. The root has a strong smell, especially when fresh, approaching to that of valerian, or NARD; the taste is at first sweetish and aromatic, but soon becomes bitterish, subacrid, and nauseous. This root is esteemed sudorific, diuretic, and emmenagogue: it is also frequently employed by the French and German physicians as an alexipharmic, and sometimes as a succedaneum for contrayerva, whence it has received the name of *contrayerva Germanorum.* In Britain it is rarely used; since it appears, from its sensible qualities, to be a medicine of much the same kind with valerian, but less powerful.

The root of the third species has been sometimes sent over from America instead of that of ipecacuanha, and mischievous effects have been produced by it. Those who cultivate this plant ought to be careful that none of its milky juice mix with any thing which is taken inwardly, as the consequences might be serious.

ASCLE'PIAS VINCETO'XICUM; officinal swallow-wort, or tame poison. The systematic name for the vincetoxicum of the pharmacopœias. See VINCETOXICUM.

ASCO'MA, (from ασκος, a *bottle); the* eminence of the pubes at the years of maturity.

A'SCOS, (ασκος), a *bottle.* Bottles were formerly all made of leather; and Hippocrates used to apply them, filled with hot water, to pained parts, as we now do bladders.

ASE'LLI, the insects otherwise called *millepedes, hog-lice*, or more commonly *wood-lice:* they are, according to Linnæus, one of the Class *aptera*, and Genus *oniscus*, comprehending fifteen species. Of the wood-louse, that variety which is of a bluish colour, and, if touched, rolls itself up into the form of a pill, was formerly much used in medicine. They are found under stones and logs of wood, in cold moist places, and in vaults. They were assigned a place in the pharmacopœia of the London College, who directed the manner in which they were to be dried; and, by physicians, they were prescribed, both fresh and dry, in hepatic and other visceral complaints, and in suppression of urine. They were reckoned diuretic, but the effects attributed to them by fanciful people at length proved to be without foundation, and they were justly discarded from the materia medica.

ASE'MUS, (ασημος, from α, priv. and σημειον, a *sign);* an epithet applied by the ancient physicians to events, in diseases, that fell out contrary to all appearance, and without any manifest cause;

as when a crisis happened, beyond their hopes, in a fever.

ASH. See Fraxinus.

ASHES, the earthy particles of combustible substances after they have been burnt in the open air. If the ashes are produced from vegetable bodies, they contain a considerable quantity of fixed salt, blended with the earthy particles: and from these ashes the alkaline salts called *pot-ash (potassa)*, *pearl-ash*, &c. are extracted. The ashes of all vegetables are vitrefiable, and found to contain iron.

A'SINUS, (from α, neg. and σινης, *hurtful); in* allusion to its harmless nature); the ass. Its milk is in much esteem as a medicine. See Milk.

ASI'TIA, or ASI'TI, (from α, non. and σιτος, *food)*; those persons were so called who could take no food for want of an appetite. See Anorexia.

ASPADIA'LIS, ISCHU'RIA; a suppression of urine from the urethra being imperforated. See Ischuria.

ASPA'LATHUM, (from α, priv. and σπαω, to *draw out)*; called also *agallochum*; calambic wood, brought from the East Indies. It is of a bituminous kind, or resinous, and of a bitter taste. It is substituted very often for the agallochum, having similar virtues, but weaker. See Lignum Aloes.

ASPA'LATHI LIGNUM. See Lignum Aloes.

ASPA'LATHUS, (from α, priv. and σπαω, to *draw out*, because its thorns are not easily drawn out when they have entered); called also *rhodium*, *lignum rosæ odoræ*, or *rose-wood*. It is the root, or wood, of a thorny shrub, but of which we have no certain account. It is brought from the Canary islands in long crooked pieces, externally of a whitish colour, internally of a deep yellow, with a reddish cast. The heaviest and the deepest coloured is the best. When rubbed or scraped, it smells like roses. To spirit of wine it gives out all its virtue; but this tincture gives nothing off by distillation except the spirit, being little if at all affected with the smell or taste of the wood. Water, however, extracts its virtues, and carries them over in distillation. The distilled water resembles that from damask roses. Fifty pounds weight of good wood afford one pound of essential oil, which is used more as a perfume than as medicine. It is weaker than the oil prepared from the petals of roses, but of the same odour. Formerly, a cordial tincture of rhodium was made by macerating ℥iv. of the wood in a pint of rectified spirit of wine: from ten drops to a tea-spoonful were reckoned a dose.

ASPARA'GUS, (ασπαραγος, a *young shoot*, before it discloses its leaves); called also, sperage, or sparrow-grass; a genus of the monogynia order, belonging to the hexandria class of plants. Of this genus there are ten species; but the only one cultivated in the gardens for human aliment, is that with an upright herbaceous stalk, bristly leaves, and equal stipula, or the *common asparagus*. This plant affords very little nourishment; and Dr. Cullen places it, in his Treatise on the Materia Medica, among the trivial diuretics.

ASPARA'GUS OFFICINA'LIS; the systematic name for the officinal asparagus. See Asparagus.

ASPA'SIA; the name of a constrictive medicine, used by the ancients for the pudendum muliebre. It consisted of wool moistened with an infusion of galls.

A'SPERA ARTE'RIA, the trachea. See Trachea.

ASPE'RULA ODORA'TA; the systematic name for the officinal matrisylva. See Matrisylva.

ASPHA'LTUM, bitumen Judaicum, or *Jews' pitch*, a light solid bitumen, of a dusky colour on the outside, and a deep shining black within; of very little taste; and having scarcely any smell, unless heated, when it emits a strong pitchy one. It is found in a soft or liquid state on the surface of the Dead Sea, and by age grows dry and hard. The same kind of bitumen is met with likewise, in the earth, in other parts of the world, as China, America, and in some places of Europe, as the Carpathian hills, France, Neufchatel, &c. There are several kinds of Jews' pitch in the shops, but none of them are the genuine sort, and have little other title to their name than their being artificially compounded by Jews. Asphaltum being a medley of we know not what ingredients, its medicinal use seems to be deservedly laid aside, notwithstanding the discutient, resolvent, pectoral, and other virtues, attributed to this bitumen by the ancients. The true asphaltum was formerly used in embalming the bodies of the dead. The thick and solid asphalta are at present employed in Egypt, Arabia, and Persia, as pitch for ships; and the fluid ones, for burning in lamps, and for varnishes. Some writers relate, that the walls of Babylon, and the temple of Jerusalem, were cemented with bitumen instead of mortar. Thus much is certain, that a true natural bitumen, that for instance which is found in the district of Neufchatel, proves an excellent cement for walls, pavements, and other purposes, uncommonly firm, very durable in the air, and not penetrable by water. The watch and clock-makers use a composition of asphaltum, fine lamp-black, and oil of spike or turpentine, for drawing the black figures on dial-plates: this composition is prepared chiefly by certain persons at Augsburg and Nuremberg.

ASPHO'DELUS, (ασφοδελος; from ασπις, a *serpent*, and δειλος, *fearful*, because it destroys the venom of serpents; or from σποδελος, *ashes*, because it was formerly sown upon the graves of the dead); the DAFFODIL; *asphodelus racemosus; caule nudi, foliis ensiformibus carinatis lævibus* Linn. This plant was formerly supposed to be efficacious in the cure of sordid ulcers, but is now laid aside.

ASPHO'DELUS RACEMO'SUS; the systematic

name for the officinal asphodelus. See Asphodelus.

ASPHURE'LATA, a vague term applied to certain metallic fossils, which are fusible by fire, and not malleable in their purest state; being, in their native state, intimately mixed with sulphur and other adventitious matter, and reduced to what are called ores. Ancient mineralogists describe this species of fossils to be five, each of which makes a distinct genus; viz. antimony, bismuth, cobalt, zinc, and quicksilver.

ASPHY'XIA, (from α, neg. and σφυξις, a *pulse*, from σφυζω, to *leap*, or *beat*, like an artery); an affection so named, because the pulse is not perceptible to the touch: the characteristic signs of it are, the symptoms of apparent death, for the most part, suddenly coming on. If a patient gradually growing worse, at length dies, that state is not an asphyxia, because it never has yet been observed that any one recovered from such a state; but it not unfrequently happens, that people have appeared to die suddenly, indeed some of them have been buried, who certainly might recover, either by the help of art, or spontaneously. This state indeed, whether it arise from the brain, the heart, or lungs, being powerfully affected, is called asphyxia; a most obscure kind of disease, and requiring the most diligent investigation of physicians. Most instances of asphyxia are varieties of apoplexy; the rest are instances of syncope, for the most part, if not all. See Lipothymia and Apoplexia.

1. The species which are considered as belonging to apoplexy, are the following of Sauvage's:

Asphyxia spinalis, i. e. *apoplexia sanguinea.*

a Mephitide,
a Musta,
a Fumis,
a Carbone,
Foricariorum,
Sideratorum,
Congelatorum, } h. s. *Apoplexiæ venenatæ.*

a Pathemate, i. e. *apoplexia mentalis.*

Suspensorum,
Immersorum,
Flatulentia, } h. s. *Apoplexiæ suffocatæ.*

Immersorum. See Drowning.

Febricosa et Hysterica, are *symptomatic apoplexies.*

2. Those which belong to Syncope are,

Asphyxia Valsalviana—Syncope cardiaca.

a Pathemate,
Traumatica,
Neophytorum, } *Syncope occasionalis.*

It is, however, necessary to remark, that those who appear to die suddenly, should be kept till they begin to grow putrid and offensive; and this should be observed in general, without respect to the cause of the disease. If it happen in consequence of an aneurism being burst, or of an apoplexy, or of a vomica, which have preceded this sudden cessation of the animal functions, a physician, knowing previously the existence of these, can more certainly judge whether it is in reality death, or only an asphyxia.

Lancisius, Winslow, and Bruhier, have written copiously on this subject; and so have many modern practitioners, particulary since the discovery of Galvanism, which has been held out as an infallible *test* in cases of asphyxia, but certainly without any good reason, as the phenomena are precisely the same as those produced by electricity. See Asthenology and Galvanism.

ASPIDI'SCUS, (from ασπις, a *buckler*); by metaphor was applied to the sphincter muscle of the anus, as we are informed by Cœlius Aurelianus. It was thus called from a resemblance in its shape. See Sphincter ani.

A'SPIS, the asp, a small poisonous kind of serpent, whose bite is described to give a speedy but easy death. It is said to be thus denominated from the Greek ασπις, *a shield*, because of the manner of its lying convolved in a circle, in the centre of which is its head, which it exerts, or raises, like the umbo or umbilicus of a buckler. This species of serpent is very frequently mentioned by authors; but so carelessly described, that it is not easy to determine which, if any of the species known at present, may properly be called by this name. It is said to be common in Africa, and about the banks of the Nile: and Bellonius mentions a small species of serpent which he had met with in Italy, and which had a sort of callous excrescence on the forehead, which he takes to have been the aspis of the ancients. It is with the asp that Cleopatra i said to have dispatched herself, and prevented the designs of Augustus, who intended to have carried her captive to adorn his triumphal entry into Rome. But the fact is contested: Brown places it among his vulgar errors. The indications of that queen's having used the ministry of the asp, were only two almost insensible pricks found in her arm. In reality, Plutarch says, it is unknown what death she died of.

Lord Bacon makes the asp the least painful of all the instruments of death: he supposes it to have an affinity to opium, but to be less disagreeable in its operation: which, however, does not so well agree with the description of the symptoms given by Dioscorides and others; who inform us, that the bite is followed by a stupor of the whole body, paleness, coldness of the forehead, continual yawning, nictitation of the eye-lids, inclination of the neck, heaviness of the head, sinking into a profound sleep, and, lastly, convulsions.

Galen describes three species of asp. To prevent the fatal effects of its bite, Paulus Ægineta (lib. v. cap. xviii.), says, that amputation is the only

remedy, where it can be performed; but, where this cannot be done, the flesh must be cut away down to the bone, so as entirely to extirpate the bite.

The ancients had a plaster called δι ασπιδων, made of this terrible animal, popularly supposed of great efficacy as a discutient in strumæ, and other indurations; and it was used likewise against pains of the gout. The flesh and skin, or exuviæ, of the asp, had also their share in the ancient materia medica, which attributed powerful medical properties to preparations of the most dangerous reptiles.

ASPLE'NIUM RU'TA MURA'RIA; the systematic name for the ruta muraria of the pharmacopœias. See RUTA MURARIA.

ASPLE'NIUM SCOLOPE'NDRIUM; the systematic name for the scolopendrium of the pharmacopœias. See SCOLOPENDRIUM.

ASPLE'NIUM TRICHO'MANES; the systematic name for the trichomanes of the pharmacopœias. See TRICHOMANES.

A'SSA FŒTIDA, (from the Hebrew *asa*, to heal); a gum-resin, or concrete juice, procured from the root of the *ferula assa fœtida* Linn. *Ferula foliis alternatim sinuatis obtusis.* Class, *Pentandria;* order, *Digynia;* nat. ord. *Umbellatæ.*

The plant which yields this useful drug is perennial, and grows plentifully on the mountains in the provinces of Chorassan and Laar, in Persia. It has, however, borne fertile seeds in the open air in the botanic garden of Edinburgh. The gum is procured from the roots which are at least four years old, and when the leaves begin to decay. The stalk is then twisted off, and the earth removed from about the large tapering roots. The tops of these are cut off transversely; and in about forty-eight hours the juice, which has exuded, is scraped off. A second transverse section is then made, and this operation repeated until the root be entirely exhausted of juice. The juice is lastly exposed to the sun to harden.

It is imported to us in large irregular masses, consisting of various little shining lumps, which are partly of a whitish colour, partly reddish, and partly of a violet hue. Those masses are accounted the best which are clear, of a pale reddish colour, and variegated with white tears.

This drug has a strong fetid smell, much like that of garlic; and a bitter, acrid, biting taste. It loses some of its sensible properties by long keeping: a circumstance to be particularly regarded in its exhibition in diseases.

From 1920 parts of assa fœtida, Neumann procured 1350 of alkoholic extract, and afterwards 190 watery, and inversely 550 watery. The smell resides entirely in an essential oil which rises in distillation, both with alkohol and water. More than 60 were procured from 1920 grains.

Dr. Cullen's remarks on this remedy, are noticed under the head of ANTISPASMODICS. In this character, it is the most powerful of all the fetid gums. It acts also as a stimulant, expectorant, emmenagogue, and anthelmintic; and its action is quick and penetrating on the system.

It is often serviceable, in the croup; in dyspepsia, amenorrhœa, and chlorosis; in the asthma, dyspnœa, and hysteria; and in tympanites.

It is exhibited, according to circumstances, in the following forms: 1. In substance, in the form of pills; the dose from five to twenty grains, either alone, or combined with bitter extracts or purgative remedies. 2. Dissolved in simple distilled water, as that of *pulegium.* 3. Dissolved in proof spirit, as a tincture. 4. In the form of clyster, to the extent of about two drachms.

The officinal preparations of it are: Assa fœt. pur. *Lond.* Lac assæ fœtidæ, *Lond.* Tinctura fœtida, *Edin. Lond. Dubl.* Tinct. castor. comp. *Edin.* Spiritus ammoniæ fœtid. *Edin. Lond. Dubl.* Pil. aloes cum assa fœt. *Edin.* Pil. assæ fœtid. comp. *Edin.* Pil. galban. comp. *Lond.* Emp. assæ fœtid. *Lond.*

ASSES' MILK. See MILK.

ASSIMILATION, (*assimilatio*, from *ad*, and *similis*, to make like to); the conversion of the food into nutriment.

Dr. Fordyce, after describing the organs of digestion, the matters applied by them to the food, and the substances employed as such, points out the following facts: "that all the substances employed for food, have all and every one of them the same elements exactly, and each of them all the elements necessary for the formation of chyle; that is, all the elements that are actually found in chyle: that therefore it is only necessary that these elements should be separated from one another, and recombined, in order for its formation: that the action of the stomach, duodenum, and perhaps jejunum, together with the fluids applied, induce, in the matter employed for food, one operation, by which its elements are disunited, and reunited in a new manner, and into a new matter; which matter, although it may be mixed with other substances, is in itself always the same in all its properties, and that this matter is, by a new operation, induced by the action of the duodenum and the fluids it meets with there, to have its elements again disunited, and reunited so as to form the three essential parts of the chyle, which, therefore, cannot be influenced in the smallest degree by the food, and that these three essential parts of the chyle are always the same, and therefore, when converted into blood, the blood *a fortiori* cannot be in the smallest degree influenced by the food. And moreover, that provided a sufficient quantity of food be employed, and the organs of digestion are sufficiently powerful in their action, and the fluids applied properly added, a sufficient quan-

tity of blood will be formed, and that too large a quantity of food does not produce too large a quantity of blood."

The conversion of various substances used as food into chyle, which is called *assimilation*, is most ingeniously illustrated by the same author. The elements of which the chyle itself, as well as of those substances, both animal and vegetable, which form it, are the same; the process of assimilation consisting merely in a decomposition of the former, and a peculiar recombination of their several elements, under the particular circumstances of animal digestion. Speaking of flesh meat, taken as food, the doctor says:—

"It appears then that the muscle and the chyle do not differ from one another in any other respect, excepting that the elements of which they both equally consist, are united by one mode of combination in the muscle, and in another mode of combination in the chyle. That the conversion, therefore, of the muscle into the chyle is a separation of its elements from one another, and a recombination of them in a different manner, so that the compound shall have new properties.

"By a parity of reasoning it may be proved, that all animal food, in being digested or converted into chyle, has the effect produced by a separation of its elements from one another, and recombination of them in a different manner, so as to form chyle, a new compound; and likewise, since by putrefaction, farinaceous matter, and all other vegetable food, may be made to yield exactly the same substances with animal substances, particularly with chyle; that is, nitrous and muriatic acids, volatile alkali, water, volatile hepar sulphuris gas, inflammable air, calcareous and argillaceous earths; as these are the same, whether vegetable food or chyle be putrefied, it follows that vegetable food likewise contains the same elements with chyle, and that these elements are only separated from one another, and recombined in such manner as to produce and become chyle.

"Digestion then is performed on substances containing all the elements of chyle. These substances in the stomach, and other organs of digestion, have their elements separated from one another by the effects of the stomach, and other organs of digestion, upon them, occasioning in them a decomposition and recombination of their elements into a new substance."

The circumstances, under which these processes take place, fall more properly to be considered under the article DIGESTION.

ASSO'DES, an ardent kind of tertian fever, attended with great inquietudes, nausea, vomitings, thirst, and delirium. The skin in this disease is moderately warm, but inwardly there is great heat. See AMPHIMERINA.

A'STACHUS FLUVIA'TILIS, the crevis or cray-fish. These are found in rivers; are of the same general nature as crabs and lobsters. They afford the concretes called crab's-eyes. See FISH.

A'STER, star-wort, a genus in Linnæus's botany. He enumerates thirty-eight species.

A'STER, a name of the several species of inula. 1. Aster atticus, the golden star-wort. 2. Aster maritimus, the tripolium. 3. Aster omnium maximus, i. e. Inula. 4. Aster peruanus, the potatoe.

ASTE'RIA, called also bastard-opal, and star-gem, which last name it receives from its sparkling like a star. It is generally said to be a species of opal; it is transparent like crystal, but much harder. It is a name also of the fossil oculus cati.

ASTE'RIAS, the fossil otherwise named ASTROITES.

ASTHE'NIA, (ασθενια; from α, priv. and σθενος, *strength*); extreme debility. The asthenic diseases form one of the great branches of the Brunonian hypothesis. See BRUNONIANISM, and the articles STHENIA and DEBILITY.

ASTHENOLOGY, (from α, priv. σθενος, *strength*, and λογος, a *discourse*); the doctrine of diseases arising from debility. The disciples of the Brunonian school, as they denominate themselves, maintain peculiar opinions on this subject, as we have shewn under the article BRUNONIANISM.

In a German treatise on *the Art of preserving feeble Life*, and of supporting the Constitution under the Influence of incurable diseases, by Dr. Struve, the author treats the subject with considerable address.

"In the present period," says he, "when the number of asthenic diseases is so considerable, this art must recommend itself; and, indeed, never was it so necessary both for the physician and the patient. This is the case in particular, among physicians of the first class, who have to struggle against artificial as well as natural debilities. It too often happens that asthenia exists to such a degree among enervated people, weakened by their mode of life, that no hope is left of restoring their lost health, much less of converting their increasing infirmities into rustic health and strength; and that the highest triumph which the medical art can obtain, is to assist the gouty voluptuary, or the nervous lady of fashion, to hold out for a couple of years longer; especially when he has to counteract or overcome incessant irregularities and debilitating habits, which his patients will not abandon. How many physicians, by their situation, are obliged to acquire experience in this great art, and yet are blamed because the artificial life which they procure to their exhausted patients, for a number of years, comes at length to an end."

The doctor treats minutely on the nature of the vital principle, animal organization, the symptoms or phenomena of feeble life, and asthenic diseases, together with their causes. In his concluding ob-

servations on the former, he says, "The vital principle may exist in an organized body in very different degrees. The difference depends on the organization of the body itself; according as it is more or less susceptible of the vital principle.

"This difference of susceptibility is observed, 1. In the nature and construction of different bodies: thus there is more vital principle in plants than in animals. 2. In the particular vital susceptibility of organized bodies of the same genus: thus some men have a much greater quantity of the vital principle than others.

"This susceptibility of the vital principle is, 1. *Original:* innate as it were; *fortes creantur fortibus.* 2. *Accidental:* it is destroyed by diseases which effect a derangement of the organization.

"A total loss and deprivation of the vital principle, and a commencement of the free action of the chemical powers in the body, is death.

"Death ensues:

"1. In consequence of the organization being destroyed, by which means it is rendered incapable of being acted upon by the vital principle. This is effected, (1.) By the force of external powers and violent impressions. (2.) By the gradual decay of vital susceptibility in the organization in the course of time: death in old age, when the organs become insensible to external stimulants; when their susceptibility of irritation even is blunted, by which the progress of the bodily functions is rendered sluggish and tardy, so that they can be excited only by uncommon stimulants, till the machine at length stops. (3.) By the long continuance of very violent excitement, or an immoderate activity of the vital principle, which produces weakness and death; an irregular life, uninterrupted mental irritation.

"2. Or by the loss of the vital principle itself, even when the organization is in a perfect condition, in which case the vital organs alone suffer.

"Death ensues either *suddenly*, when the body is at once exhausted of the vital principle; or *slowly*, which is common natural death. Except in these sudden cases, the transition from life to death takes places slowly; and the vital principle always lingers in the chief organs, even when it has been withdrawn from all the external parts of the body. In the most common kind of death, the transition takes place by means of apparent death, or apparent external death. We ought never to conclude that real death has taken place, until the operation of the chemical powers has begun to produce decomposition and putridity. It is on these alone that we can establish any certain signs for ascertaining real death, and not on deficient individual effects of the vital principle, deficient excitability, &c. Unfortunately, therefore, we have no sign of death, on which greater dependance can be put, than corruption, until we shall be able to discover the commencement of the free activity of the chemical powers, which takes place before it is perceptible to us by external signs.

"Every thing that has been said of the vital principle may be applied to life. Life is a product of the vital principle, depending on the state of the organizations and external stimulants. We cannot properly call it, as Brown does, a *forced state;* since it is as free as the vital principle, though it cannot exist but under certain conditions. The different degrees of life are as those of the vital principle. Its strength or feebleness depends on the quantity and activity of the vital principle. The quantity and activity of the vital principle are not always in the same ratio. A great deal of life may exist where the activity of the vital principle is small, and irritability weak. On the other hand it is possible that, with a high degree of vital activity, life may be exceedingly feeble. This is immoderate, diseased vital activity and irritability, which often manifest themselves a little before death, and by which the small quantity of the vital principle still remaining is soon exhausted. The only proof of a great deal of life is a continual uninterrupted activity of the vital principle, without being exhausted. Thus people in the years of youth, can, without injury to their powers, undertake very severe labour.

"For this purpose a great susceptibility of the organization for the vital principle is required; and consequently solid, irritable fibres; these must, 1. Have the property of being easily acted upon by the vital principle. 2. Must be durable enough to bear the continued impulse of stimulants. The organization loses both these in old age; and hence arise insensibility, weakness, and rigidity." The means of maintaining and supporting feeble life are afterwards suggested on these principles, but though free from some of the vices of that system of which Dr. Struve professes himself an admirer, we cannot go to any length in exhibiting a superstructure which, however specious in its appearance, rests on so dubious a foundation. The author adds the treatment of the so called *incurable* diseases. See DEBILITY.

A'STHMA, (from *αω*, or *αημω*, *spiro*, or rather *αaζω*, *anhelo*, to *breathe short*). The *asthma* is a difficulty of breathing, coming on at intervals, with a sense of straitness in the breast, and sibilating respiration; at the beginning of the paroxysm, attended with an uneasy cough, or no cough at all; towards the conclusion, a free cough, often attended with a copious expectoration of mucus." Dr. Cullen ranks this genus of disease in the class *Neuroses*, and order *Spasmi*, dividing it into three species. 1. *Asthma spontaneum;* to which belong the *orthopnœa spasmodica*, and *hysterica*, when there is no manifest cause, nor any other disease attending. 2. *Asthma exanthematicum*, when it arises from the retropulsion of some acrid humours

from the surface of the machine. 3. *Asthma plethoricum*, when it is the consequence of some accustomed sanguinary evacuation suppressed, or a spontaneous plethora. Other species have been described, as the *hypochondriac*, *arthritic*, and *venereal;* but these are merely symptomatic.

Dr. Cullen observes, that the *asthma* depends upon a particular constitution of the lungs ; that the *proximate cause* is a preternatural, and, in some measure, a spasmodic constriction of the muscular fibres of the bronchiæ, which not only prevents the dilatation of the bronchiæ, necessary to a free and full inspiration, but gives also a rigidity, which prevents a full and free expiration. This preternatural constriction, like many other spasmodic and convulsive affections, is readily excited by a turgescence of the blood, and other causes of any unusual fullness and distension of the vessels of the lungs.

1. The attack of the CONVULSIVE ASTHMA is sudden, and at its first appearance the fit is short. The symptoms which usually precede it are languor, flatulency, head-ach, sickness, pale urine, disturbed sleep, a sense of straitness and fulness about the pit of the stomach. In some cases there is an uncommon stupor, drowsiness, and heaviness. The fit is frequently observed to come on about one or two o'clock in the morning, or at any hour after the first sleep. The patient wakes suddenly, and feels a great tightness and constriction around the chest, with a difficulty of breathing, and an impediment to the free admission of air into the lungs. Both inspiration and expiration are slow, laborious, and accompanied with constant wheezing, particularly the latter. Great bodily anxiety always attends this disorder. As the lungs cannot be sufficiently dilated with air, the passage of the blood through the pulmonary vessels is not free. Hence the face, in full and plethoric habits, appears red and bloated, and the vessels of the eyes are unnaturally turgid with blood. The action of the heart is greatly disturbed, as is evident by the weakness, irregularity, and increased quickness of the pulse. During the fit the patient has generally a longing instinctive desire for cool fresh air, which always revives him. A small close room with a fire in it is extremely offensive to him, and all warm things, given internally, increase the flatulency in the stomach and bowels, which is always the most troublesome after a full meal. When the fit has continued a few minutes, half an hour, or an hour, it leaves the patient ; his respiration becomes free and natural, his pulse slow and regular, his complexion puts on its usual appearance, and the anxiety goes off. The urine is generally pale, and the skin somewhat dry before the fit, and during its progress ; but at the termination of it, the urine, for a day or two, is high coloured, and deposits a sediment, and the skin feels soft and moist.

This is the description of a first and moderate attack of the disorder. In some cases it appears in a more violent form, even at its commencement, and continues for several days before the fit terminates. Sometimes the patient will have one fit, and then remain free from a relapse for many months. At other times fits come on for several nights together, the patient appearing almost perfectly well during the day, with his appetite and pulse both natural. When the *asthma* once makes its attack, it seldom or never fails to recur, though the intervals between the fits are very uncertain. When the *asthma* is become habitual, it often occurs in the spring and autumn.

In many cases it has been said to attack periodically, once in ten days or a fortnight ; and sometimes to occur at the full and change of the moon only. Floyer mentions a case where the fits occurred for seven weeks together, and the patient was obliged to sleep in a chair. From the strictest observation, however, it is found that there is, in general, no regularity in the attacks of the asthma. Relapses are commonly attended with an increase of the symptoms, and the vigour of the constitution is gradually impaired, till, at length, general weakness is induced. The difficulty of breathing in the fit arises to a higher degree, the sense of tightness over the breast is most distressing, the patient's anxiety at this period is inexpressible, and he labours in respiration, as if every moment would be his last. Severe vomiting frequently occurs, and the matter discharged is slimy and frothy, or of a greenish or yellow colour. The hands and feet are cold, and the patient is subject to palpitations and faintings. Cool fresh air becomes absolutely necessary. The eyes are prominent, the face is sometimes pale, and sometimes high coloured, bloated, or livid ; the pulse is extremely weak, irregular, and even intermitting ; there is a difficulty of swallowing, the patient can scarcely speak, cough, or expectorate during the fit, and the stomach and bowels are violently distended with wind. While thus labouring for breath, he is obliged to rise from his bed, he cannot bear even the weight of the bed-clothes upon him. His shoulders are constantly elevated, to give the muscles of the chest their greatest power of action, in raising the ribs in inspiration. At this time, too, the patient, though before costive, will frequently have a loose stool.

When the violence of the fit abates, and respiration becomes free, the cough returns, and the patient begins to expectorate phlegm, which is sometimes intermixed with blood. This expectoration is one of the most certain signs of the abatement of the complaint, as it denotes the solution

of the spasmodic contraction on the bronchial vessels; particularly if a moisture and softness of the skin, and a sediment in the urine, make their appearance at the same time. The blood which is spit up in this complaint proceeds generally from a rupture or dilatation of blood-vessels in the lungs. In some cases, indeed, the quantity of blood which is spit up is, in full habits, very considerable, and at the same time critical, being accompanied with an abatement of the symptoms. But all free discharges of blood from the lungs, though they afford relief, are unfavourable, as they denote greater violence of the disease, during the course of which the very efforts of nature to relieve are in themselves so alarming. The nose too will sometimes gush out with blood during the severity of the fit, from the obstruction given to the return of the blood through the pulmonary vessels into the left auricle of the heart.

Thus in a short time the fit of the spasmodic asthma goes off. In a course of years, however, one fit succeeding another, the disorder increases, on the whole, in the violence and duration of the fits, as well as in the frequency of their returns. The expectoration from the mucous glands of the lungs, which still continues to relieve at the termination of the fits, becomes itself a very troublesome symptom. The mucous glands are relaxed, and the discharge of mucus is greater than natural. Hence the bronchiæ or air-vessels are frequently obstructed with phlegm, and from this cause the freedom of respiration is disturbed: the patient breathes with unusual difficulty, although his convulsive fits be absent. When he first wakes in the morning he has generally a severe fit of coughing, which continues till he has got up the phlegm that provoked the cough, by preventing the free admission of air into the lungs. Through the day, at different times, the cough still recurs, but with less violence, and in the evening it is often very teazing and distressing, especially on any sudden motion of the body, or in cold damp foggy weather, which obstructs the exhalation of the perspirable matter from the lungs. Thus the *humoral asthma* is united with the convulsive, and both together exist in the same patient.

2. The HUMORAL ASTHMA is an affection of the mucous glands of the lungs, in consequence of which they are relaxed, and the discharge of mucus, being unnaturally copious, obstructs the freedom of respiration. This part of the disorder is more constant; the convulsive *asthma* is more violent, and of shorter duration. The humoral *asthma* is more severe, both with respect to the cough and difficulty of breathing, in winter; but in summer, when the weather is warm, and perspiration free, it often disappears totally between the intervals of the fits of the convulsive *asthma*. The convulsive *asthma* too is sometimes severer in winter than in summer, especially when combined with the humoral, or with a catarrh. But it often happens that the warm weather affords little or no relief; nay, even in many cases it is observed, that the irritability of the constitution and the rarefaction of the blood is so much increased by the warmth of the weather, that the frequency and severity of the fits is greater in the warm and sultry, than in the cold, seasons of the year. In this case the humoral *asthma* is continued on during the summer months by the convulsive *asthma*, as a symptom of the natural and critical solution of the fits. But even in this situation of the patient, the symptoms of the humoral *asthma* are greatly alleviated by the warmth of the weather, which is by no means constantly the fact with respect to the convulsive *asthma*. Along with or after the convulsive *asthma*, either when pure or when complicated with the humoral, there is often a great soreness in the breast, partly from the obstructed circulation, partly from the spasmodic contraction of the muscular fibres of the air-vessels, and partly from the frequency and severity of the cough. Sometimes too there are rheumatic stitches in the sides, which are extremely painful and alarming to the patient; but the judicious practitioner will easily distinguish them from internal affections of the breast, by the external soreness and the increase of the pain in consequence of motion.

The frequent returns of the fits sometimes cause obstructions in the lungs, which, as the dissection of dead bodies clearly ascertains, appear full of knots or tubercles. These tubercles are most liable to occur in those who have naturally a narrow contracted chest, in which the lungs have not a free and easy motion: these render the disorder very obstinate, they cause a long continuance of the cough after the asthmatic fit, and frequently end in small inflammations of the lungs, attended with internal pains, difficulty of breathing, feverishness, profuse sweats, and wasting of the flesh. It has been already observed, that the humoral *asthma* often supervenes on the convulsive. It is necessary also to remark, on the other hand, that the convulsive often attacks those who have long been previously afflicted with the humoral *asthma*. By frequent returns of the fits, the latter, at last, becomes habitual to the patient, and he has the misfortune to find himself labouring under a complication of two diseases; the one aggravating the other, and both growing worse.

The spasmodic *asthma* sometimes attacks persons of a thin spare habit, whose constitutions have been greatly emaciated by a long exposure to causes of general or chronic weakness. In some cases it seizes patients who are robust and full of blood, particularly if they have small vessels and narrow

chests. At other times it occurs in those who are gross, phlegmatic, corpulent, and in such habits it is often very distressing. It is frequently connected likewise with hysterical and hypochondriacal complaints, in irritable and relaxed constitutions. The spasmodic *asthma*, recurring for many years, is capable of reducing the strongest constitutions, and of bringing on the symptoms of general debility; but if it attacks a constitution already weakened and exhausted, it is obvious that it will necessarily weaken and exhaust it more. The patient will lose weight, sink from his clothes, and appear emaciated, especially if the bronchial glands are so relaxed that a considerable quantity of mucous matter is expectorated.

The stomach and bowels are more particularly liable to be affected in the spasmodic *asthma;* they are often seized with colic pains, distended with wind, tormented with burning heats, and agitated with tremulous motions, which give a sensation to the patient of something moving and fluttering within him. Sir John Floyer too has observed, that slight fits of the *asthma* often affect the stomach and bowels, and not the lungs. The appetite is greatly impaired, sleep is often prevented, or it is disturbed and unrefreshing. The menses are sometimes obstructed, and sometimes they are brought on before the usual period; and when plethora prevails, that discharge is accompanied with relief. The patient is sometimes costive, though sometimes he will have loose stools. The extremities, particularly the arms, shoulders, and upper parts of the body, are often affected with great uneasiness. Symptoms of fever are not essential to the disease, though they frequently occur, especially when the humoral *asthma* or a catarrh is complicated with the convulsive. A hectic fever, with a colliquative diarrhœa, faintings, palpitations, violent vomitings, coldness of the extremities, swelled legs, and other dropsical symptoms, arising from weakness, relaxation, and obstruction to the circulation of the blood through the lungs, is common in the last stage of the disease. But a hectic fever, indeed, will sometimes occur in very irritable and relaxed habits, when no immediate danger is threatened. This disease may attack at any age, but its general approach is after the prime of life.

3. From the preceding account of the symptoms of the dry or convulsive *asthma*, it will appear obvious that the *distinction* of it from every other disease cannot be difficult. The sudden attack of the fits, the short time of their duration, the violence of their symptoms, the state of ease and good health intervening between them, and their returning at intervals, sufficiently characterise the complaint. This species, however, as has been already observed, is sometimes combined with the humoral *asthma*, with peripneumony, and other complaints of the breast. The *disposition to asthma commonly results from the operation of cold, moisture, sudden changes of weather, dust, metallic fumes, smoke and other particular smells, mephitic vapours, severe evacuations, great fatigue, neglect of exercise, shouting, and all strong exertions of the voice, certain disorders in the constitution, depressing passions of the mind, excess in venery, and particularly from intemperance.*

The prognostics of the disease are to be estimated from the violence and duration of the symptoms, the age of the patient, the condition of the constitution, the nature of the predisposition, and the power of the exciting causes. If the symptoms of the spasmodic affection in the lungs run high, if the disorder be of long standing, and, when once excited, continues for several days: if the returns of it be frequent; if the lungs be greatly obstructed with phlegm at the termination of the convulsive fits, and an obstinate cough remains during the intervals, with a laborious respiration, and a copious expectoration of mucous matter, the cure is difficult, tedious, and uncertain. Tubercles and obstructions in the lungs, &c. are symptoms too unfavourable to admit of hope. If, on the contrary, the disorder be recent; if the patient's constitution be not greatly impaired; if there be no natural deformity in the chest; if respiration after the termination of the fit be free, and the cough with expectoration of phlegm not violent, nor obstinate in its duration; if the occupation of the person be not injurious to the lungs, or, if so, can be easily relinquished; and if the lungs be not obstructed with tubercles, either in consequence of a scrophulous habit, or repeated inflammatory affections, the case bears a favourable aspect, and may in all human probability be frequently treated with success.

4. Our first attempt, in the *treatment* of both species of *asthma*, must be to alleviate the spasmodic strictures of the breast, and parts subservient to respiration then existing. Secondly, we are to employ such remedies as may counteract the constitutional affection.

The patient's diet should be light: sweet things, and such as are flatulent, must be avoided: large and full meals are injurious, or any food that is difficult of digestion; but many asthmatic subjects bear animal food of the lighter kinds, and in moderate quantity, very well. In recent asthma, and especially in the young and plethoric, a spare diet is necessary: but after the disease has continued for some years, they commonly bear, and often require, a better diet, though in all cases a very full one is hurtful. For drink, water, or some cool watery liquor, is the most fit for asthmatics; all liquors ready to ferment, become flatulent, and are hurtful: any kind of strong drink they seldom can bear; and any excess in the latter

is always dangerous to them. Copious warm and tepid drinks are improper, on which account, and because it tends to weaken the stomach, tea is to be avoided. Exercise should be moderate, but regular; and daily riding on horseback, going in a carriage, and especially sailing, are highly useful. The feet should be kept warm, and perspiration assisted with a flannel shirt.

Experience must determine with respect to the air which these patients breathe. It is difficult to give any general rules, as different asthmatics have different idiosyncrasies. Some are only easy in a dry serene air in the country, others must live in the midst of a great city; though the former bear the air of a low ground, if tolerably free and dry, better than that of amountain. In both or any case, the natural perspiration should be carefully supported. A check given to this is the most frequent cause of *asthma* in Britain, consequently a particular regard should always be had to it.

The *asthma* seldom admits of bleeding, except where there is plethora; and it must be observed, that a pulse strong and slow does not indicate bleeding in the same degree as if it were strong and frequent. A strong, frequent, and hard pulse, demands a frequent discharge by bleeding. But much discretion is required in this, from various difficulties that occur in judging of the case.

Vomits are very properly administered in *asthmas*. Some physicians, however, decline their use in the first instance, from an apprehension that the efforts in vomiting might be dangerous. Supposing this well grounded, (which, however, we doubt), the best practice is to employ a purgative of calomel, joined with some suitable aloetic pill, which will afford the most immediate relief. When the expectoration shall have become somewhat free, emetics may be given with perfect safety and advantage. The *oxymel scillæ* and *antimonium tartaris*. are by many esteemed the best; but Dr. Percival preferred, and with some reason, the ipecacuanha, which, whether in the humoral or spasmodic kinds, he always used as speedily in the fit as attending circumstances would admit, and experienced the speediest relief by it. When he prescribes the ipecacuanha in chronical cases, he orders from three to five grains, or from five to fifteen grains, every other morning, according to the degree of the disease, and without regard to any particular paroxysm, and thus continues it for three, four, or six weeks. It proves as useful when it only excites nausea, as when it pukes; whence it seems, that in its quality of a relaxant, its virtue principally consists. When the spasmodic attends the humoral *asthma*, we may also prescribe the ipecacuanha, with every chance of success. Dr. Cullen remarks, that, "as flatulency in the stomach, and other symptoms of indigestion, are frequent attendants of *asthma*, and very troublesome to *asthmatics*, so, both for removing these symptoms, and for taking off all determination to the lungs, the frequent use of gentle vomits is proper in this disease." In certain cases, where a fit was expected to come in the course of the night, a vomit given in the evening has frequently seemed to prevent it.

Expectorants, in the moist *asthma*, are important aids. Garlic is celebrated by some in these cases (See Allium). Squills and gum ammoniacum, however, are most commonly used; but perhaps a cautious use of tobacco might be made to exceed any of the medicines now employed for this end; for those, who are not used to chew tobacco, are very speedily relieved by holding it in the mouth until a sickness comes on, and then going into bed to sweat. It cannot, however, be reckoned a safe remedy in the hands of any but medical men.

The best general forms of expectorants are the following:

℞ Lac. ammoniac. ℥vij.
Oxymel. scillæ ℥j.
Vin. antim. tart. ʒj. M.
Detur coch. j. vel ij. ter die.

The gum ammoniac, and others of similar virtues, may be formed into pills, and combined with soap; or a mass may be composed thus:

℞ Assæ fœtidæ.
Bals. tolut. aa ʒj.
Syr. allii q. s.
Fiant pil. med. quarum capiat iij. vel iv. ter die.

These pills may be washed down by a medicated wine, impregnated with squills, horse-radish root, and mustard seed.

The *mistura ammoniacalis* of St. Bartholomew's Hospital in London, is equally proper, viz.

℞ Lactis ammoniaci ℥iiiss.
Tinct. scillæ ʒij.
Tinct. opii gut. x. Misce.
Detur unc. ss. subinde.

Dr. Hugh Smith says, the attenuating, stimulating medicines will best succeed as expectorants.

℞ Sal. corn. cerv. vol. ℈ſs.
Succ. limon. ʒiij.
Aq. cinnam. ten. ℥j. ʒij.
Syr. scillæ ʒjſs.
Misce fiat haust. sexta quaque hora sumend.

Or,

℞ Lac. ammoniac. ℥j.
Aq. cinnam. ten. ʒvj.
Sperm ceti sol. ℈j.
Sal. corn. cerv. vol. ℈ss.
Oxymel. scillæ ʒjss.
Misce fiat haustus.

℞ Aq. cinnam. ten. ℥jss.
Flor. benzoini, gr. iij.
Vin. ipecacuanhæ.
Syr. croci, aa ʒj.
Misce fiat haustus.

The *balsamic pill* of Fuller's Pharmacopœia, recommended by Dr. Morton in his Treatise on the pulmonary consumption, will be highly advisable in this, as well as some other diseases of the lungs.

℞ Gum ammoniac. ʒjss.
Flor. benzoini, ʒj.
Balsam. Peruv. gr. xv.
Bals. sulphur. q. s.
Fiat pill. No. xii. e ʒj. sumend. iv. mane et vesp.

Mustard whey, as common drink, may be proper, or a decoction of the madder root, which as an attenuant and expectorant, is a medicine exceeded only by few. Thus,

℞ Rad. rub. tinctorum, ℥j.
Macis, ʒij.
Coque ex aq. fontan. q. s. ad colatur. lib. ij.
Adde, Tinct. aromatic. ℥ss.
Syr. limon. ℥ij.
Misce fiat Apozema; sumend. ℥iij. ter quaterve de die.

In some chronic cases, mercury will be found serviceable; in others, flowers of sulphur, made into an electuary with honey or syrup of garlic; or either of the following, used at Guy's Hospital:

℞ Bals. Locatelli,
Cons. rosæ rub. sing. ℥iv.
Bals. sulphur. ℥j. M.
Dosis drachma una ter die.

℞ Aq. menth. sativ. ij.
Aq. piment.
Oxymel. scillæ sing. ℥j. M.
Dosis cochl. unum frequenter.

If a costive habit should prevail, it will be necessary from time to time to give a few grains of pills of aloes and myrrh, soap and aloes, or a mass of equal parts of rhubarb, scammony, and soap.

Dr. Temple directs in the paroxysm:

℞ Sp. vitriol. æther. ℥j.
Detur coch. minim. in quovis vehiculo.

℞ Opii purif. gr. j.
Fiat Pil. hora somni sumend.

He says the vapour of æther may be inhaled, which is likely to give great and speedy relief in the paroxysms. Assafœtida, and the warm bath should be ordered; and the patient should be made to breathe an atmosphere mixed with hydrogen, if it be the pure spasmodic asthma; if it is what is called the humoral, or moist, he should respire an air with hydro-carbonic air, or with an increased proportion of oxygen. See Pneumatic Medicine.

The *dry* or *spasmodic asthma*, during the extreme violence of the fit, is best relieved by opiates; and sometimes very large doses are required. But in order to obtain permanent relief, nothing is found to answer better than the ipecacuanha in small doses. Three, five, eight, or ten grains, according to the strength and constitution of the patient, given very other day, have been productive of the happiest effects; acting sometimes as an evacuant, pumping up the viscid phlegm; at others as an antispasmodic or sedative. Issues are generally recommended in both species, and will often be found useful.

When the asthma is found to depend on some other disease, whether it be the gout or an intermittent fever, or when it proceeds from the striking in of some cutaneous eruption, regard must be always had to the primary disease: thus, in the *asthma arthriticum*, sinapisms to the feet, or blistering, will be absolutely necessary, in order, if possible, to bring on a fit of the gout. And when the dregs of an ague give rise to an asthma, which is termed *febriculosum*, and attacks at regular intervals, we must have recourse to the Peruvian bark. The *asthma exanthematicum* will require blisters or issues, to give vent to the acrid matters which were repelled from the surface of the body; and courses of sulphureous waters, goats' whey, and sweetening diet drinks, or perhaps mercurial alteratives, in order to correct the habit of body.

An habitual difficulty of breathing, differing in many circumstances from asthma, is named *Dyspnœa*. See Dyspnœa.

ASTRAGALOI'DES; the name of some species of *Orobus;* also of the bastard milk-vetch.

ASTRA'GALUS, (αςτραγαλος, *a cockal, or die;* because it is shaped like the die used in ancient games.) A bone of the *tarsus*, upon which the tibia moves, is thus named. It is placed posteriorly and superiorly in the tarsus, and is formed of two parts, one large, which is called its body, the other small, like a process. The part where these two unite is termed the neck.

ASTRA'GALUS EXSCA'PUS; the stemless milk-vetch. The root of this plant, *Astragalus exscapus; acaulis exscapis leguminibus lunatis, foliis villosis,* Linn. is said to cure confirmed syphilis, especially when in the form of nodes and nocturnal pains.

ASTRA'GALUS TRAGACA'NTHA; the systematic name for the plant which affords the gum tragacanth. See Tragacantha.

ASTRA'NTIA; black master-wort, a genus in Linnæus's botany. He enumerates four species.

ASTRINGE'NTIA, (from *astringo*, to bind to), ASTRINGENTS; such medical substances as, applied to the human body, produce a contraction and condensation in the soft solids, and thereby increase their density and force of cohesion. When these are applied to longitudinal fibres, the contraction is made in their length; but if applied to circular fibres, they diminish the diameters of the vessels or cavities which the fibres embrace.

The operation of astringents in general, in condensing the animal solid, has been said, by most writers on the Materia Medica, to appear from their use in the tanning of skins for leather, in which they are frequently employed. But the examination of this process by chemical means, does not altogether justify this supposition, the *tannin*, or tanning principle, being distinct from the astringent principle, as we are assured by Mr. Davy.

In the same operation, Dr. Cullen says, we may observe the antiseptic power, of this class of substances; which seems to depend upon their preserving the firmness and cohesion of the animal substances to which they are applied, for a much longer time than would take place in these substances without such application.

" By what means astringents produce the contraction of the solid parts of animal bodies," says he, " is not very evident. It does not seem to be by introducing a matter into their substance; and in some cases it seems to be rather by absorbing and abstracting their fluid parts. In some cases, where the substances applied are such as coagulate the fluids of the human body, as acids and alkohol, we can readily understand how the same should condense and contract the solids formed of the same fluids which those matters coagulate. It does not, however, appear, that other astringents, void of acidity, act in the same manner; and their operation must be referred to an attraction taking place between these astringents and the particles of the animal solid."

In forming his catalogue of substances according to their several operations on the human body, it seemed proper to distinguish them as they operate upon the simple solid, which is much of the same nature in the dead as in the living body; or as they operate upon the *sensible and moving solids*, which have their qualities and powers only as they exist in a living body. This distinction, on many occasions, he considers both necessary and useful, though not to be followed throughout; and on these occasions, where the substances in question at the same time operate upon both the simple and the living solid, the consideration of their operation cannot, of course, be taken separately. This is the case with respect to astringents which often operate upon the solids of both kinds, though it has not always been observed; for it has been commonly supposed, that astringents act more upon the simple than upon the living solid; and therefore, that they act almost only on the parts to which they are immediately applied.

Thus Dr. Heberden, in writing on hemorrhagy, says,—" I do not lay any great stress upon the use of internal astringent remedies, because it does not appear likely, from reasoning, that they should do any service; and I am far from being convinced by experience that they ever do, except perhaps in hemorrhagies of the primæ viæ," *Med. Trans.* vol. II. p. 432. This, however, Dr. Cullen does not hold to be just; since by the corrugation and constriction of the whole mouth and fauces, which happens from a small portion of an astringent substance being applied to only a small part of the tongue, it is evident that astringents act upon the sentient nerves; and therefore that the astringent effects may be communicated from the part to which they are immediately applied, to very distant parts of the body. The same conclusion appears clearly also from this; that astringents taken into the stomach show their effects in other parts of the body so quickly, that they can hardly be supposed to have passed further than the stomach itself; and therefore their sudden effects in distant parts must necessarily be ascribed to an astringent power, communicated from the stomach to those other parts.

" It may, indeed, be alleged," says Dr. Cullen, " that the astringent matter is in some cases carried further than the stomach, and into the course of the circulation: but it must still be observed, that in many of those cases the quantity of matter introduced is so small, that when again diffused in the mass of blood, and equally distributed to the different parts of the body, it is obvious, that the portion of it applied to a particular part cannot be sufficient to produce any effect upon it; and therefore the effects which appear must be ascribed to the general operation on the stomach. Of all this doctrine, and particularly of the propagation of astringent power from the stomach to other parts, we have a strong proof in this, that some of the most simple astringents taken into the stomach, very soon after, prevent the recurrence of a paroxysm of an intermittent fever, which implies a very general operation on distant parts.

" As it is, therefore, established, that astringents act upon the moving fibres, as well as upon the simple solid, it will be readily conceived, that to their operation on the former their most considerable effects on the living body are to be ascribed. As they contract the moving fibres, and increase their force of cohesion, they must increase their contractility, or what I call their tone, and they are, therefore, often properly named Tonics; and upon the same ground are

fitly enough named Strengtheners or Roborants: which under these titles will be more fully considered hereafter.

"The matter of astringents has been variously judged of, and generally supposed to consist of acid and earth. In the astringents of an acerb taste, such a composition seems to be evident; and the supposition is confirmed by observing, that an astringent quality is produced by certain combinations of acid and earth as in the case of alum. We must not, however, conclude this to be a general proposition, as in many cases a combination of acid and earth produces matter of very little astringent power, as happens in the case of acids joined with calcarious earths: this, in magnesia alba, produces matter of a purgative quality. We cannot, therefore, admit of this general proposition, that astringents are formed by a combination of acid and earth. With respect to the greater part of the vegetable astringents, the presence of an acid is by no means evident; and it is certain, that in the greater part of them, the quantity of acid is not so much as to saturate the earthy or other parts of the matter in their composition: for the whole substance of the astringent appears still to be a powerful absorbent of acids capable of abstracting them from other substances withwhich they are joined."

It is of some little importance to know in what manner we can discover an astringent quality to exist in certain bodies: this Dr. Cullen explains in the following way:

"In the first place," says he, "we discover it most certainly by their effects on the human body, and that by the taste they give in the mouth; a sense of constriction not only in the parts with which they come immediately in contact, but also in the whole of the internal surface of the mouth and fauces. This sense of constriction is different from different substances; and its degree may be taken as a mark of the power which such substances may exert as astringents in the stomach, or other parts of the body.

"In the second place, we discover an astringent quality in bodies by their being applied to a solution of vitriolated iron, in which they produce a black colour. This we suppose to be owing to the astringents abstracting the acid of the vitriol from the iron it was before joined with; and that therefore the iron falls down in the form of a black powder."

He does not insist further on the theory of this operation, but endeavours to apply it afterwards to the purpose for which he writes.

As astringent substances applied to the solution of vitriol and iron, produce more suddenly a black colour, and that in a greater degree in proportion to the other marks they give of their astringency, so we may employ this experiment to determine the power of astringency in different substances. *Bergius*, in his Materia Medica, has given experiments of the application of almost every vegetable substance to the solution of green vitriol; and these Dr. Cullen thinks have been accurately made. From them we learn, what has just now been alleged, that the astringent power is in proportion to the *suddenness* with which they strike a black colour, and to the *degree* in which they produce it. By this the same author points out what substances are the most powerful astringents; and in like manner, what are the weaker kinds of the many which formerly entered promiscuously into our lists of astringent substances. Dr. Cullen, nevertheless, thinks it proper to observe, that every substance which strikes a black colour with a solution of vitriolated iron, is not to be considered as an astringent; for it may happen that a small portion of astringent matter may be present in substances in which a matter of contrary quality in reality prevails; and there cannot be a stronger instance of this than in the mallow, the juice of which strikes a blackish colour when submitted to this test: and from the experiments of *Bergius*, it appears that the same happens with respect to many other vegetable substances which are not astringent.

Another observation which the Doctor makes, is, that there are certain astringents, which otherwise give proof of their astringent power, and yet do not strike a black colour with the solution of vitriolated iron, or at least do it more weakly than in proportion to their astringent powers. We have an instance of this in the juice of quinces, and some other acerb substances; which is probably owing to the astringent matter in these substances being saturated with the acid that is already present in them.

The general effects produced by astringents on the human body are in a great measure already expressed above; but in what different states of the body, that is, in what diseases they are properly to be employed, is a subject yet to be treated of.

"In all cases of general debility," says Dr. Cullen, "they may be supposed to be useful; and in that state which has been called a *cachexy*, and which often forms the beginning of dropsy, the preparations of iron formed by a combination of an acid with that metal have been employed with much benefit: but I do not know of any other simple astringent, that in the same case has been employed with advantage. In one case, their power in taking off the atony of the system is very remarkable, and that is in the case of intermittent fevers. I have shown that the recurrence of the paroxysm of intermittent fevers depends upon the recurrence of a state of atony in the system, and that the paroxysm is prevented by various means of obviating the recurrence of that atony; and frequent experience has shewn the power of astringents in this respect. It is true, that, even for this purpose, their tonic

powers are much increased by their being combined with bitters; but as the most simple astringents frequently answer the purpose, it does not prevent our perceiving that astringents, by themselves, are capable of increasing the tone of the moving fibres over the whole body.

"Astringents are considered as especially useful in restraining excessive evacuations; and, in the first place, hemorrhagies, or the evacuations of red blood; and I have no doubt of their being fitted for this purpose, or of their truly answering it; but I must own, that there is no practice in which I have been more frequently disappointed than in the employment of astringents in the case of hemorrhagy. I ascribe my failure to this, that though astringents taken into the stomach give some increase of tone over the whole system; yet they are not powerful enough for producing such constriction in distant parts, as may be sufficient for overcoming the increased impetus of the blood in the vessels. This, however, I would assert with respect to certain astringents only, and allow that there may be, in the different kinds, more or less power of propagating their effects from the stomach to distant parts, as will be noticed under particular astringents.

"It is proper, nevertheless, to observe, that the different effects of astringents will depend on the nature of the hemorrhagy to which they are applied. Hemorrhagies may depend upon the increased action of the vessels forcing an opening or rupture in their extremities, or the same disease may depend upon a loss of tone in the extremities of the blood-vessels, allowing them to be opened without any increase in the action of the vessels; and merely by the ordinary, or perhaps even a less than usual, impetus of the blood in them. In these two kinds of hemorrhagy the effects of astringents must be different. In the former, they may not only be ineffectual, but may be actually hurtful, by increasing the tone and action of the vessels; and it is only the latter case to which they are properly adapted, and can be useful, as will be better understood from the doctrine concerning menorrhagia. See Menorrhagia.

Remedies of the astringent class are also employed in restraining the excess of serous evacuations; and are therefore employed in the case of diarrhœa. —"Here," says Dr. Cullen, "their efficacy is evident; and will be readily accounted for by their being immediately applied to the parts affected. But it is extremely necessary here to take notice of an error very generally prevailing in writers on the materia medica, in their relating the virtues and powers of astringents. They very generally mention the virtues of astringents as equally adapted to diarrhœa and to dysentery. In this sentiment too, some practical writers acquiesce; but I maintain that these two diseases are very different from one another; since, while diarrhœa consists in an increased evacuation from the exhalants and excretories on the internal surface of the intestines, which may be restrained by astringents applied, the dysentery consists of, or depends upon, an increased constriction in a considerable portion of the intestinal canal, which must be increased by the application of such astringents. This is now well understood; and practitioners very universally observe, that astringents are not only ineffectual, but very hurtful in dysentery; and therefore we assert, that the marking of astringents as equally adapted to both diseases is a pernicious error.

"But farther, astringents are said to be suited to the restraining of other serous evacuations than diarrhœa; yet I must say, that in practice I have been as much disappointed in these cases as in the case of hemorrhagy: and upon the same ground, that the effects of astringents taken into the stomach are not propagated so powerfully to distant parts as to produce the constrictions required in them. This I have had occasion to observe with regard to the *leucorrhœa*. For the cure of this disease, I find forty remedies recommended by writers on the materia medica; but I have met as many cases of it, in which not one of those remedies were of any service."

It is probable, Dr. Cullen thinks, that the greater number of practitioners have had occasion to observe the same inefficacy of internal astringents in the case of serous evacuations from the urethra in males; and that they therefore will agree with him in thinking, that materia medica writers have been too liberal in ascribing virtues to astringents in those cases.

Some may suppose that there is an analogy between those cases of increased serous evacuation, and the excessive discharge of a serous fluid from ulcers; and, therefore, that to remedy this, internal astringents may very well be employed. The propriety of this measure may, he thinks, be well founded; but at the same time, it does not appear that the good effects in these cases depends upon a constriction produced on the extremities of the vessels pouring out the fluids, so much as upon restoring the tone, or perhaps even the inflammatory state, of the vessels, that is necessary to these good effects.

In describing the general effects of astringents, Dr. Cullen mentions their singular power of relieving the symptoms which attend the calculus in the urinary passages. "Among the dissertations," says he, "of *De Heucher*, formerly a professor at Wittemberg, there is one entitled, '*Calculus per adstringentia pellendus.*' In this he shows, that almost at all times, and by the most eminent physicians, astringents have been employed in calculous cases. He is, indeed, intent upon showing, that astringents have been employed in promoting

the excretion of calculi; but I presume that, in the cases in which those remedies appeared successful, the calculous matter was only supposed to be evacuated, because the patient was relieved from the symptoms that he formerly laboured under. But we now know that these symptoms may be relieved without the stone's having been dissolved or evacuated: and among other medicines that may operate in this manner, I believe astringents may be reckoned. A proof of this appears in the use of the leaves of the *uva ursi;* which not only from the experiments of the late De Haen, but also from my own, I have found to be often powerful in relieving the symptoms of calculus. This plant is manifestly a powerful astringent; and in what manner this, and other astringents are useful in the cases mentioned, may be difficult to explain; but I shall offer a conjecture on the subject. I suppose their effects to depend upon their absorbing acid in the stomach. Their powerful attraction of acid we have mentioned above: and that thereby they may be useful in calculous cases, is rendered probable by this, that the medicines which of late have been found the most powerful in relieving the symptoms of calculus, are a variety of alkalines, which are known to do this without their acting at all in dissolving the stone."

Having thus pointed out the diseases in which astringents are useful, Dr. Cullen remarks on the absurdity of some materia medica writers who describe them as useful in a disease in which, both from theory and experience, it is known that they are of no use at all; that is, in the case of *hernia*, which does not depend upon any laxity of the intestinal canal, but rather on the laxity of the containing parts to which no astringents can have access. After mentioning the diseases in which astringents are supposed to be useful, he next observes that "they are improperly employed in restraining evacuations, whether of blood or of serous fluids when these evacuations can be truly considered as critical, or as necessary to relieve a plethoric state of the system, except when the said evacuations proceed to an excess that threatens to be in danger of inducing death, or at least of inducing a great and dangerous debility. In such cases, the judicious practitioner will balance between the consequences to be apprehended: yet the disciples of Stahl, and other German physicians, by supposing plethora and cacochymy more frequently than they really exist, have limited the employment of astringents too much.

"Astringent matter is very generally present in the vegetable kingdom, and sometimes in all the different parts of plants; but most frequently in their barks, sometimes in the roots, more rarely in the leaves, and more seldom still in the flowers; though there are exceptions to all of these as general rules.

"With respect to the pharmaceutical treatment of astringents, we in the first place observe, that they are most useful when they are taken in their entire state, and when given, as the common language is, in substance; and we are persuaded that the gastric liquor extracts them more powerfully than any other menstruum we could apply. It is, however, on many occasions, proper to employ them in a liquid form; and for that purpose they have been treated by distillation, infusion, and decoction.

"Astringents very rarely consist of odorous or volatile parts. They are universally of a fixed nature, and nothing rises from them in distillation with water; and even in those cases where their odorous and volatile parts arise, it is found that no part of the astringent quality is at the same time communicated to the distilled water; and therefore the distilled waters drawn from astringents, formerly kept in the shops, were on that account absolutely inert.

"Astringents are properly enough treated by infusion, and readily yield their qualities either to an aqueous or spirituous menstruum. The extract obtained by water is in larger proportion than that obtained by spirit: but that the astringency is greater in the one than in the other, is not certainly determined; and the choice of the infusions is made rather according as the menstruum is more or less adapted to the purpose of the medicine, than by any consideration of the astringent power extracted by it.

"Astringents are also treated by decoction in water; and in this way a stronger impregnation can be obtained than by infusion: but it appears to me that the astringent matter is extracted in a more entire state of infusion, and that in decoction there is always some decomposition takes place; with what effect, however, on the substance as a medicine, we cannot certainly determine."

Some notice may be proper on the use of astringents as topical remedies. When employed with this view, astringents of the mineral class are generally preferred; at least when application is made of them to the skin, which is less susceptible of their action than the internal organs. Thus they are used of all degrees of corrugating power, from the weakest watery solutions of the metallic salts, earths, &c. as those of vitriolated zinc, acetated ceruse, alum, &c. to astringents that border on causticity, as the concentrated acids themselves, mixed with oil, &c. The ancients indeed, from their partiality to vegetable remedies, placed great reliance on substances to which we ascribe very feeble virtues, even when administered internally. Some of these they also employed in the most disadvantageous manner, as in plasters, and in other tenacious compositions. Thus *strengthening plasters*, in which *sanguis draconis*, *bole*, &c. were

deemed efficient ingredients had a place even in our late dispensatories.

The particular astringents that have been employed in medicine, are treated under their several names in the alphabetical arrangement.

ASTROCHI'TES, also called ASTROITES, star-stone. It is of a brown colour, an inch long, angulated, and at the ends marked with the figure of a star. It is thought to be a part of some sea-animal petrified. Some of them are white: they are found in quarries in England, Germany, &c.

ATA'BULUS, in physiology, a provincial wind in Apulia, of a dry pinching quality, and very noxious in its effects. The ancient naturalists speak of the Atabulus in terms of horror, on account of the ravage it made among the fruits of the earth, which it scorched or withered up.

ATA'XIA, (αταξια, from α priv. and τασσω, *to order)*, ATAXY, some particular irregularity or disorder. This word is used frequently by the ancients, and sometimes by the moderns, to express an irregularity in a disease or distemper out of the common course of symptoms.

A'TEBRAS, a subliming vessel used by the ancient chemists.

ATE'CHNIA, (ατεχνια, from α priv. and τεχνη, *an art)*, want of art. When this word is used as expressive of disease, it is synonymous with ANAPHRODISIA.

ATHAMA'NTA CRETE'NSIS; the systematic name used for the *daucus creticus* of the pharmacopœias. See DAUCUS CRETICUS.

ATHAMA'NTA OREOSELI'NUM; the systematic name for the officinal *oreoselinum*. See OREOSELINUM.

ATHANA'SIA (αθανασια, from α priv. and θανατος, *death)*, immortality. This pompous name is given to several ancient compositions; as antidotes, collyriums, &c. also to the herb tansey, because, when stuffed up the nostrils of a dead corpse, it is said to prevent putrefaction.

ATHANA'SIA, a genus in Linnæus's botany. He enumerates twenty species.

ATHA'NOR. The ancient chemists have distinguished by this name, a furnace so constructed that it can always maintain an equal heat, and which shall last a long time without the addition of fresh fuel. The body of the athanor has nothing in it particular, and is constructed like an ordinary furnace. But at one of its sides, or its middle, there is an upright hollow tower, which communicates with the fire-place by one or more sloping openings. This tower ought to have a lid which exactly closes its upper opening. When the athanor is to be used, as much lighted coal is put in the fire-place as is judged necessary, and the tower is filled to the top with unlighted fuel. The tower is then to be exactly closed with its lid. As the coal contained in the tower has no free communication with the external air, it cannot burn till it falls into the fire-place.

The athanor was much celebrated, and used by the ancient chemists. It has been particularly described by many authors, and was formerly found in all laboratories; but at present this furnace is much less employed, and even neglected. The reason of this is, that all the ancient chemists were in search of the art of making gold; and undertook, without hesitation, operations which required great length of time, and unremitted heat. Whereas now, these alluring hopes having vanished, the cultivators of chemistry have no other view than to extend and perfect the theory of this essential part of natural philosophy, on more worthy principles, and by more appropriate and convenient means. Hence the instruments used in long operations, and particularly the athanor, are now neglected; and also because in the latter, the fuel in the tower is apt to stick there, or else to fall down at once in too great quantity. The lamp-furnace, which is a true athanor, may be successfully employed in operations which do not require much heat.

ATHENÆUS, a physician, born in Cilicia, cotemporary with Pliny, and founder of the pneumatic sect. He taught that the fire, air, water, and earth, are not the true elements, but that their qualities are, heat, cold, moisture, and dryness; and to these he added a fifth element, which he called *spirit*, whence his sect had its name.

A'THER, (αθηρ); the beard of barley; also the top of the beard of an arrow.

A'THERA, (αθηρα); a sort of food made with wheat-flour, like the pap-meat which is given to children. Pliny says it is an Egyptian invention.

ATHERO'MA, (from αθηρωμα, *pulse*, *pap*, or a kind of *poultice)*; a kind of tumor, thus named from its contents, which resemble a poultice. It is a species of wen. It is colourless, without pain, of an irregular shape, not easily pressed with the finger, and, when pressed, does not easily rise again; in which it differs from the *Meliceris*.

ATHY'MIA, (αθυμια, from α priv. and θυμος, *courage)*, pusillanimity; in the old medical authors, usually signifies that dejectedness, despondency, anxiety, and despair, which often occurs in disorders. Some have used this word as synonymous with *Melancholia*.

A'TLAS, (ατλας; from ατλαω, to sustain, because it sustains the head; or from the fable of Atlas, who was supposed to carry the globe upon his shoulders). This name is given to the first cervical vertebra in the human skeleton. It differs very much from the other vertebræ. See VERTEBRÆ. It has no spinous process, which would prevent the neck from being bent backwards, but in its place it has a small eminence. The great foramen of this is likewise much larger than that of any other vertebra. Its body, which is small and thin,

is nevertheless firm and hard. It is somewhat like a ring, and is distinguished into its *great arch*, which serves in the place of its body, and its *small posterior arch*. The atlas is joined superiorly to the head, by the articulation named ginglymus; and inferiorly, to the second cervical vertebra, by means of the inferior oblique processes and the odontoid process by trochoides.

ATMOSPHERE, *(atmosphera*, from *ἀτμος, vapour*, and *σφαιρα, a circle)*; the gazeous, or aeriform fluid, which every where invests the surface of our globe. This term is used to signify the whole of the fluid mass consisting of air, aqueous and other vapours, electric fluid, &c. which surrounds the earth to a considerable height, and partakes of all its motions, both annual and diurnal. Health greatly depends on the state of the atmosphere, consequently it deserves to be thoroughly understood by medical men.

It appears from accurate experiments, that the air we usually breathe, is composed of scarce one fourth part of oxygene or pure air; the other three parts, or more, consisting of what Dr. Priestley calls *phlogisticated*, and M. Lavoisier *mephitic air*. Besides these sorts of air, it is obvious that the whole atmosphere contains a great deal of water, together with a vast heterogeneous collection of particles raised from all bodies of matter on the surface of the earth, by effluvia, exhalations, &c. so that it may be considered as a chaos of volatile particles confusedly mingled together, and spontaneously undergoing a variety of chemical changes and decompositions.

There is, however, one fluid, namely, the electrical, which is very distinguishable in the composition of our atmosphere. To measure the absolute quantity of this is perhaps impossible; yet we know that it pervades the surrounding medium universally, and that it appears to be more abundant in the superior than the inferior regions. It seems also to be the immediate bond of connexion between the atmosphere and the water which is suspended in it; and by its various operations, the phænomena of hail, rain, snow, lightning, &c. are occasioned.

The uses of the atmosphere are many and great, and too generally known to need a particular description. Of its salubrity, however, we are bound to speak more at large. On the tops of mountains the air is generally more salubrious than in pits or very deep places. Indeed dense air is generally more salubrious than that respired in low places. Dense air is always considered more proper for respiration, as to the mere quality of density only, than that which is rarer. But then the air on mountains, though rarer, is more free from impure vapours than that of pits; and hence it has been found that people can live very well on the tops of mountains, even when the air is but about half the density of that below. But it would seem, that at some intermediate height between the two extremes, the air is the most salubrious and proper for animal life; and this height, according to M. Saussure, is about 500 or 600 yards above the level of the sea.

Besides the changes arising from the mere difference of altitude, the salubrity of the atmosphere is greatly affected by many other circumstances. The air, when confined or stagnant, is commonly more impure than when agitated and shifted: thus, all close places are unhealthy, and even the air in a bed-chamber is less salubrious in a morning, after it has been slept in, than in the evening. Dr. White, in Philos. Trans. vol. lxviii. gives an account of experiments on this quality of the air, and remarks one instance when the air was particularly impure, viz. September 13, 1777; when the barometer stood at 30′ 30, the thermometer at 69°; the air being then dry and sultry, and no rain having fallen for more than two weeks. A slight shock of an earthquake was perceived on that day. In vol. lxx. of the same Transactions, Dr. Ingenhousz gives an account of some experiments on this head, made in various places and situations: he finds, "That the air at sea, and close to it, is in general purer, and fitter for animal life, than the air on the land:" but the Doctor did not find much difference between the air of the towns and of the country, nor between one town and another. The Abbé Fontana drew nearly the same conclusions from accurate experiments, asserting, "that the difference between the air of one country and that of another, at different times, is much less than what is commonly believed; and yet that this difference in the purity of the air at different times, is much greater than the difference between the air of the different places observed by him." Finally, M. Fontana concludes in these words, "Nature is not so partial as we commonly believe. She has not only given us an air almost equally good every where at every time, but has allowed us a certain latitude, or a power of living and being in health in qualities of air which differ to a certain degree. By this I do not mean to deny the existence of certain kinds of noxious air in some particular places; but only say, that in general the air is good every where, and that the small differences are not to be feared so much as some people would make us believe. Nor do I mean to speak here of those vapours and other bodies which are accidentally joined to the common air in particular places, but do not change its nature and intrinsical property. This state of the air cannot be known by the test of nitrous air; and those vapours are to be considered in the same manner as we should consider so many particles of arsenic swimming in the atmosphere. In this case it is the arsenic, and not the degenerated air, that would kill the animals who ventured to breathe it."

Experiments, indeed, of a much later date might be adduced to shew, that the proportion of oxygen in the atmosphere differs little in countries extremely distant, and even extremely different in their known effects on the human constitution. Thus, when put to the test of the Eudiometer, scarcely any difference has been found to exist between air brought from the banks of the most unwholesome rivers of Africa, and that obtained from the most healthy and open plains in England. Mr. Davy, Professor of Chemistry, publicly examined, by the same means, a quantity of air which he had brought to London from the land's end, and found it not sensibly different in purity from that of the lecture-room at the Royal Institution, in which 400 or 500 persons had been shut up for above half an hour. The cause of insalubrity then, in the atmosphere in different situations, is not exclusively, nay, perhaps not frequently, to be traced to the deficiency of oxygen in its composition, but rather to deleterious vegetable or animal particles in a volatile state.

As the atmosphere envelops all parts of the surface of our globe, if they both continued at rest, and were not endowed with a diurnal motion about their common axis, then the atmosphere would be exactly globular, according to the laws of gravity; for all the parts of the surface of a fluid in a state of rest, must be equally removed from its centre. But as the earth and the ambient parts of the atmosphere revolve uniformly together about the axis, the different parts of both have a centrifugal force, the tendency of which is more considerable, and that of the centripetal less, as the parts are more remote from the axis; and hence the figure of the atmosphere must become an oblate spheroid; since the parts that correspond to the equator are farther removed from the axis, than the parts which correspond to the poles.

But a circumstance of great importance with regard to the atmosphere, and one on which some of its most material effects on the body depend, is its pressure or weight. It is evident that the mass of the atmosphere, in common with all other matter, must be endowed with these properties; and this principle has been asserted by almost all philosophers, both ancient and modern. By the barometrical tube, it is found that the pressure of the atmosphere sustains a column of quicksilver, of about 30 inches in height; it therefore follows that the whole pressure of the atmosphere is equal to the weight of a column of quicksilver, of an equal base, and 30 inches in height: and because a cubical inch of quicksilver is found to weigh nearly half a pound averdupois, therefore the whole 30 inches, or the weight of the atmosphere on every square inch of surface, is equal to 15 pounds. Again, it has been found that the pressure of the atmosphere balances, in the case of pumps, &c. a column of water of about $34\frac{1}{2}$ feet high; and the cubical foot of water weighing just 1000 ounces, or $62\frac{1}{2}$ pounds, $34\frac{1}{2}$ times $62\frac{1}{2}$, or 2158lbs. will be the weight of the column of water, or of the atmosphere on a base of a square foot; and consequently the 144th part of this, or 15lb. is the weight of the atmosphere on a square inch; the same as before. Hence Mr. Cotes computed, that the pressure of this ambient fluid on the whole surface of the earth is equivalent to that of a globe of lead of 60 miles in diameter. And hence also it appears, that the pressure upon the human body must be very considerable; for as every square inch of surface sustains a pressure of 15 pounds, every square foot will sustain 144 times as much, or 2160 pounds: then, if the whole surface of a man's body be supposed to contain 15 square feet, which is pretty near the truth, he must sustain 15 times 2160, or 32400 pounds, that is nearly $14\frac{1}{2}$ tons weight, for his ordinary load. By this enormous pressure we should undoubtedly be crushed in a moment, if all parts of our bodies were not filled either with air or some other elastic fluid, the spring of which is just sufficient to counterbalance the weight of the atmosphere. But whatever this fluid may be, it is certain that it is just able to counteract the weight of the atmosphere, and no more: for, if any considerable pressure be superadded to that of the air, as by going into deep water, or the like, it is always severely felt let it be ever so equable, at least when the change is made suddenly; and if, on the other hand, the pressure of the atmosphere be taken off from any part of the human body, as the hand for instance, when put over an open receiver, from whence the air is afterwards extracted, the weight of the external atmosphere then prevails, and we find the hand strongly pressed down into the glass.

The difference in the weight of the air which our bodies sustain at one time more than another, is also very considerable, from the natural changes in the state of the atmosphere. This change takes place chiefly in countries at some distance from the equator; and as the barometer varies at times from 28 to 31 inches, or about one tenth of the whole quantity, it follows that this difference amounts to about a ton and a half on the whole body of a man, which he therefore sustains at one time more than at another. On the increase of this natural weight, the weather is commonly fine, and we feel ourselves what we call braced, and more alert and active; but, on the contrary, when the height of the air diminishes, the weather is bad, and people feel a listlessness and inactivity about them, especially when these changes take place very suddenly; for it is to this circumstance chiefly that a sensation of uneasiness and indisposition is to be attributed. Thus, in going up to the tops of mountains, where the pressure of the atmosphere is diminished two or

three times more than on the plain below, little or no inconvenience is felt from the rarity of the air, if it is not mixed with other noxious vapours, &c. because that, in the ascent, the body has had sufficient time to accommodate itself gradually to the slow variation in the state of the atmosphere: but when a person ascends with a balloon, very rapidly, to a great height in the atmosphere, he feels a difficulty in breathing, and an uneasiness of body; and the same is soon felt by an animal when inclosed in a receiver, and the air suddenly drawn or pumped out of it. So also, on the condensation of the air, we feel little or no alteration in ourselves, except when the change happens suddenly, as in very rapid changes in the weather, and in descending to great depths, in a diving bell, &c.

It is not easy to assign the true reason for the variations that happen in the gravity of the atmosphere in the same place. One cause of it, however, either immediate or otherwise, it seems, is the heat of the sun; for where this is uniform, the changes are small and regular. Thus between the tropics, it appears, the change depends on the heat of the sun, as the barometer constantly sinks about half an inch every day, and rises again to its former station in the night time. But in the temperate zones the barometer ranges from 28 to near 31 inches, shewing, by its various altitudes, the changes that are about to take place in the weather. If we could know, therefore, the causes by which the weather is influenced; we should also know those by which the gravity of the atmosphere is affected. These may, perhaps, be reduced to immediate ones, viz. an emission of latent heat from the vapour contained in the atmosphere, or of electric fluid from the same, or from the earth; as it is observed that these both produce the same effect with the solar heat in the tropical climates, viz. to rarefy the air, by mixing with it, or setting loose a lighter fluid, which did not before act in such large proportion in any particular place.

With regard to the alteration of heat and cold in the atmosphere, many hypotheses have been given, and many experiments made. Notwithstanding all the explanations, however, that have been attempted by philosophers, very considerable difficulties remain with regard to these circumstances. That warm air should always ascend; and thus, when the source of heat is taken away by the absence of the sun, that the stratum of atmosphere lying immediately next to the earth should be somewhat colder than that which lies a little farther up, is not much to be wondered at. It does not, however, appear why such degrees of cold should take place at the surface of the earth as we sometimes meet with. It is, besides, no uncommon thing to meet with large strata in the upper regions of the atmosphere, remarkable for their cold, while others are warmer than those at the surface; as aerial navigators have asserted. It is also difficult to conceive why the air which has once ascended, and become rarefied to an extreme degree, should afterwards descend among a denser fluid of superior gravity, though indeed the atmospherical currents by which this fluid is continually agitated may have considerable effect in this way.

For an account of the effects of the deleterious mixture of elastic fluids in the atmosphere, in particular climates and situations, see the articles Amphimerina, Marsh Miasmata, &c.

ATO'CIUM; a name of the *Lychnis sylvestris.*

ATO'LLI; a sort of pap, made of the meal of maize and water, which the Indians mix with their chocolate.

ATOM, (ατομος, from α priv. and τεμνο, *to cut or divide)*, in philosophy, signifies a particle of matter, so minute, as to admit of no division. Atoms are the *minima naturæ*, and are conceived as the first principles or component parts of all physical magnitude.

Asclepiades taught that *atoms* were the primordia of all things, and that they were not perceptible to our senses, but, only to our understanding; that they had no qualities, for the qualities of bodies which they compose, depend on the order, figure, number, &c. of many atoms joined together; and this last circumstance he attempted to prove, by observing, that a lump of silver is white, but when filed down it becomes black; and horn, which is black when whole, is white if filed down. Galen says, very truly, that Asclepiades, adhering to the opinions of Democritus and Epicurus, with regard to the principles of bodies, had only changed the former names of things, called *atoms* molecules, and, a vacuum, pores; the former being divisible, but *atoms* not divisible.

ATOMICAL PHILOSOPHY, or the doctrine of atoms, a system which, from the hypothesis that atoms are endued with gravity and motion, accounted for the origin and formation of things. This philosophy was first broached by Moschus, some time before the Trojan war; but was much cultivated and improved by Epicurus; whence it is denominated the *Epicurean philosophy.*

ATO'NIA, (ατονια, from α, priv. and τεινω, to *stretch)*, atony; a defect of muscular power; relaxation, laxity, debility. It is generally reckoned to be synonymous with palsy.

Dr. Cullen considers atony as having a material concern in fevers. The doctor is inclined to this opinion; first, because it is certain that debility lays the foundation of fever: secondly, because, supposing this uncertain, we can more easily perceive how debility induces spasm, than how spasm produces debility, which always more or less appears: and, thirdly, because we perceive that the degree

of spasm formed, and the obstinacy of its continuance, depend, in many cases, upon the power of the causes inducing debility, and upon the debility induced; for the more powerful the debilitating causes, and the greater the debility produced, the paroxysms are the longer, and the more frequently repeated. From hence, says he, we are led to believe, that, together with the spasm, there is an atony subsisting in the extreme vessels, and that the relaxation of the spasm requires the restoring of the tone and action of these.

This may be illustrated from considering the symptoms which take place with respect to the functions of the stomach in fever; such as the anorexia, nausea, and vomiting. The connexion, or consent, which we observe between the perspiration and the appetite in healthy persons, renders it probable, that the tone of the extreme vessels on the surface of the body, and that of the muscular fibres of the stomach, are connected or consenting with each other; and that therefore in fevers the want of appetite, or of tone in the muscular fibres of the stomach, may depend upon the atony of the extreme vessels on the surface of the body. A further proof that in fevers the fibres of the stomach are affected with an atony, is the nausea and vomiting which so frequently occur, and which so commonly depend upon a debility of the stomach. That the debility of the stomach which produces vomiting depends upon an atony of the extreme vessels on the surface of the body, appears particularly from an observation of Sydenham. In the attack of the plague, a vomiting happens, which prevents any medicine from remaining upon the stomach; and Dr. Sydenham tells us, that he could not overcome this vomiting but by external means, applied to produce a sweat or determination to the surface of the body.

The connexion between the state of the stomach and that of the extreme vessels on the surface of the body appears from this also, that the vomiting, which so frequently happens in the cold stage of fevers, commonly ceases upon the coming on of the hot, and very certainly upon any sweats coming out. It is indeed probable, that the vomiting in the cold stage of fevers, is one of the means employed by nature for restoring the determination to the surface of the body; and it is a circumstance affording a proof both of this and of the general connexion between the stomach and surface of the body, that emetics thrown into the stomach, and operating there in the time of the cold stage, commonly put an end to it, and bring on the hot stage. It also affords a proof of the same connexion, that cold water, taken into the stomach, produces an increase of heat on the surface of the body, and is very often a convenient and effectual means of producing sweat.

We draw a proof of the same connexion from this also; that cold applied to the surface of the body, when it does not stop perspiration, is always a powerful means of exciting appetite. It may also be considered, whether the fever, which so constantly accompanies the digestion of food in the stomach, be not induced by filling the stomach, by relaxing its muscular fibres, and thereby inducing an atony of the extreme vessels.

The doctor acknowledges a difficulty in explaining how an atony and spasm can subsist at the same time in the same vessels; but considers it as a matter of fact which cannot be denied; and, at the same time, thinks it may be found analogous to what happens upon other occasions in the system, where we often observe atony producing spasm. This atony is supposed to depend upon a diminution of the energy of the brain; and that this diminution takes place in fevers, he concludes, not only from the debility prevailing in so many of the functions of the body, as already mentioned, but from the symptoms peculiar to the brain itself.

ATONIC; an epithet signifying relaxation, diminished strength, weakness, debility. See ATONY.

ATRA'BILIS, black bile, or melancholy. According to the ancients, this was a fruitful source of disease, and supposed to have a twofold origin: 1st, from the grosser part of the blood, which they called the *melancholy humour*. 2dly, from yellow bile being highly concocted. Dr. Percival suggests, that it is the gall rendered acrid by a stagnation in the gall-bladder, and rendered viscid by the absorption of its fluid parts. Bile in this state, discharged into the duodenum, occasions violent vomiting, or purging, or both. Previous to this, the pulse is quick, the head aches, a delirium comes on, with a hiccough, intense thirst, inward heat, and a fœtid breath. He recommends the *infus. senna limoniat.* warmed with the *tinct. columb.* as the best means of checking these vomitings.

ATRACHE'LUS, (ατραχηλος, from α, priv. and τραχηλος, the *neck*); short-necked.

ATRACTY'LIDIS, a name of a plant which resembles the atractylis.

ATRA'CTYLIS, distaff-thistle, a genus in Linnæus's botany. He enumerates eight species. This name is also given to the common wild carline thistle.

ATRAGE'NE, a genus in Linnæus's botany. He enumerates five species.

ATRAPHA'XIS, a genus in Linnæus's botany. There are two species.

ATRE'SIA, (from α, priv. and τιτραω, to *perforate*); imperforation.

ATRETA'RUM, a suppression of urine from the menses being retained in the vagina.

ATRE'TI, (ατρητοι, from α, priv. and τρητος, *perforated*). Those of either sex were thus called

by the ancient writers, when their anus, or other natural aperture, was closed.

ATRI'CES, small tubercles about the anus, which recede and return again, especially at the first.

ATRI'CI, small sinuses in the intestinum rectum, which do not reach so far as to perforate into its cavity.

A'TRIPLEX FŒTIDA, otherwise named *atriplex olida*, or *vulvaria*. The very fetid smell of this plant, (*chenopodium vulvaria; foliis integerrimis rhombeo-ovatis, floribus conglomeratis axillaribus* Linn.) induced physicians to exhibit it in hysterical diseases; but it is now superseded by more active remedies.

A'TRIPLEX HORTE'NSIS; the systematic name for the atriplex sativa of the pharmacopœias. See ATRIPLEX SATIVA.

A'TRIPLEX SATI'VA. This plant, *atriplex hortensis caule erecto herbaceo, foliis triangularibus* Linn. has been exhibited medicinally, but the practice of the present day appears to have totally rejected them. Both the leaves and the seeds were formerly employed.

A'TROPA BELLADO'NNA; the systematic name for the belladonna of the pharmacopœias. See BELLADONNA.

A'TROPA MANDRA'GORA; the systematic name for the plant which affords the radix mandragoræ of the pharmacopœias. See MANDRAGORA.

ATRO'PHIA, (from α, and τρεφω, to *nourish*); an ATROPHY, marasmus, or wasting, attended with loss of strength, but without hectic.

Dr. Cullen on this remarks, that an atrophy perhaps is never without fever; at least the pulse is quicker than usual; but the absence of the true hectic fever distinguishes this disease from the tabes. The Latins call it innutritio, or the want of nutrition. It is also called a *nervous consumption*. Dr. Cullen ranks this genus of disease in the class *cachexiæ*, and order *marcores*. He enumerates four species. 1. *Atrophia inanitorum*, from too great evacuations, by others called tabes nutricum;—sudotaria;—a sangui-fluxu, &c. 2. *Atrophia famelicorum*, from deficient nourishment. 3. *Atrophia cacochymica*, from bad nourishment; also named tabes syphilitica, and tabes ab hydrope. 4. *Atrophia debilium*, when the function of nutrition is so depraved as to be productive of disorder, where too excessive evacuation or cacochymia has not preceded. The atrophy of children is called *paidatropia*. Whether with the third, or fourth, is to be classed the tabes dorsalis, seems doubtful; Dr. Cullen thinks the last.

An atrophy, from whatever it may arise, has for its proximate cause, a defective exertion of the assimilating powers of the constitution, or an impediment to the application of their effects, by which even the functions of the machine ordained for its support become its destruction, through the mere want of proper nutrition. The disorder, therefore, might be considered of one kind, brought on by different causes, tending to the same end.

The causes are, a weakness in the organs of digestion, whence an undue supply of chyle to the blood; a diet that affords insufficient nourishment; a tenderness and irritability of the nervous system; a deficiency, or an excoriation, of the mucus which defends the inner surfaces of the heart and arteries; excesses of the passions; and in venereal pursuits, too copious evacuations, &c.

The signs in the beginning are, a decrease of strength, loss of appetite without much fever, cough, or a short breath, though in the progress, when a consumption of the flesh has gradually affected the whole habit, there is some degree of difficulty in the breathing; the urine is inconstant in its colour, though generally high, and small in quantity; sometimes it is pale and profuse; in time the blood grows hot and acrid for want of its due supplies, a febrile heat increases, as also a cough and difficulty of breathing. In children this disease frequently happens; and, besides the abovementioned causes, they are subject to it from a sudden change from the breast to a more solid food; in which case their legs become pendulous, the habit flaccid, their skin corrugated, and, in many instances, their appetite for food is almost insatiable. As a weakness in their chylopoietic organs is the cause, so, on dissecting those patients after death, their mesenteric glands are tumified, their livers much disordered, their intestines filled with black fetid sordes, and the muscles of their bellies extenuated almost to membranes.

This disorder should be distinguished from leanness, the rickets, and that weakness and leanness in some children, who pine only for want of a due supply from the breast.

The cure will be regulated by the cause. If this disorder depends on any other, as on a diarrhœa, fluor albus, diabetes, gonorrhœa, &c. the cure will depend on the cure of the original disease. If the cause be indigestion, with a seeming obstruction of the mesentery, which is the case in children and old people for the most part, give now and then gentle doses of rhubarb with calomel; or sal polychrest; and also, in the intervals, let stomachics, with warm perspiratives, be prescribed. Carefully avoid irritating purges, for they aggrevate the symptoms by exhausting the patient. The kali acetatum, tinct. rhabard. and ferrugineous medicines, may be used, and those with the cincona adding thereto aromatics if required. If there be an irritable habit from any of the causes above specified, endeavour to abstract from the stimulus, and appease all spasmodic affections by opiates, mucilages, gentle astringents that are spicy, the bark, and such other medicines as the present symptoms may indicate. The scrophulous and

cancerous cases only admit of palliation, by keeping the circulation as low as the general health will admit. A thin light diet is the most proper, such as jellies of both vegetable and animal substances, broths, &c. not forgetting the bark, with the *acidum vitrioli dilutum*, as corroborants.

When excessive evacuations have been the cause, the decoction of sarsaparilla, salop, chalybeate waters, bark, and gentle riding, are proper. A venereal taint is often an unsuspected cause; in which case mild mercurials, with sarsaparilla, and a milk diet, are necessary for the cure.

ATTENUA'NTIA, (from *attenuo*, to make thin); medicines which are supposed to increase the fluidity of the mass of blood, not, at the same time, increasing the proportion of the water in it, but by their effect upon the other parts of the mass. To Dr. Cullen, the employment of this class of substances appeared to have proceeded upon the supposition that the preternatural spissitude of the fluids is owing to the smaller parts of them uniting together, and so forming more impervious and impenetrable masses.

The correction and alteration of this state of the fluids, is supposed to take place either by mechanical or chemical means. The first, it is supposed, may be done by a matter diminishing the size of the preternaturally gross particles, or by a matter which divides and separates the parts of these; and these last, writers have denominated Incidentia, a term very frequent in the old Materia Medica. On the subject of these operations of attenuating and inciding, Dr. Cullen first observes, that the supposition of the cause of the preternatural spissitude of the fluids is upon a mistaken foundation; and he contends, that there is no evidence of its *ever* taking place. In the second place, although the supposition were better founded, he maintains, that no such mechanical operation can be produced. But, without entering farther into the question, he quotes, the following passage from *Gaubius*, who, though bred in the Corpuscularian school of *Boerhaave*, and himself a disciple of that eminent medical teacher in various respects, yet certainly entertained doubts of its truth and propriety. This celebrated man, in one particular part of it, has given us the following passage, in the 300th paragraph of his pathology: "*An et naturæ humanæ facultatis inest, moleculas, acres detritis aut intropressis angulis in sphærulas tornando blanditiem creandi? Non satis constat speciosam ideam æqualiter in fluidam solidamque acrimoniam quadrare. Credibilius profecto mixtione chemico magis quam mechanica rotundatione id opus perfici.*"

"I dare say," continues Dr. Cullen, "the opinion of the mechanical operation of the attenuantia and incidentia will be deserted by every body; and we have, therefore, only to consider how their effects may be accounted for in a chemical way. Here, however, we meet with much difficulty. The change that happens in consequence of the exhibition of these medicines, if any at all, cannot be rendered evident in fact; and the theory of any supposed operation is not to be readily explained. What can change the state of the gluten is not well known; and we do not know of any matters applied to it out of the body that can dissolve it, except a caustic alkali, which cannot be applied to it as it flows in the vessels. Saline matters as applied to it, when it is drawn out of the vessels, do prevent its usual concretion, but these have no effect upon its consistence; for, on a quantity of water being added, the gluten separates from the rest of the mass, and shows the same qualities which it would have done upon any other occasion. I must say the same thing of the red globules, that we do not know of any substances which, in the body or out of it, can change the state of these; and, therefore, that we do not know of any substances which can change the consistence of the blood with respect to its principal parts, which we might suppose to be the most ready to form preternatural concretions. If, therefore, any such take place, it must be in the serosity; but whether ever any such concretions take place there, is not ascertained as a fact: and the supposition is not suitable to what we know of the serum, which is always a saline fluid, possessed of a solvent power with respect to the other parts of the mass of blood.

"But, however all this may be, if we can suppose that there may be concretions, or a disposition to concrete, there may be room for attenuating medicines; and I have set down a list of articles supposed to be of that kind."

The first of these which the author mentions is water, which, it is probable, not only increases the proportion of that fluid which is always distinct from the animal fluid, but even a portion of it may insinuate itself into the latter, and so be a means of diminishing the force of cohesion in it.

The next in Dr. Cullen's list of attenuants, are the substances termed alkalina, which are supposed to be powerful with this view, though this does not appear to him to be on just grounds. Originally they were supposed to operate by their septic powers; but the experiments of Sir J. Pringle overthrew this opinion: and as to their otherwise solvent powers, he thinks, that, with respect to the gluten, they are none at all; and if they act at all as attenuants, they must act merely by increasing the saline state of the serosity, and, therefore, in the same manner as the neutral salts.

The last mentioned substances have been almost universally supposed *attenuant*, but on what certain foundation it is hard to discern. They may be employed in preventing the usual concretion of

extravasated blood; but in no experiment do they show any power in dissolving or moderating the cohesion of the gluten. Dr. Cullen allows that the saline state of the serosity has a chief share in preserving the fluidity of the whole mass; and, when the saline matter is present in large proportion, it may give an unusual fluidity to the whole: but he cannot suppose that any such quantity of neutral salts that we commonly employ as medicines can have that effect. "An ounce of nitre, thrown in *par reprises*, in the course of twenty-four hours, while a portion of it is at the same time constantly passing off by the excretions, cannot possibly be ever accumulated in such quantity as to have any effect as a solvent." In the same manner, the Doctor reasons with respect to the other neutral remedies.

3. The next class of snbstances enumerated by Dr. Cullen, under the head of attenuantia, is the *sapones*. Boerhaave, it seems, was much disposed to extend the idea annexed to this term; apprehending that every combination of saline and oily matters might be considered as soap. As such a combination however takes place in almost every natural production, whether vegetable or animal, it is obvious that the term *saponaceous* must heretofore have been loosely and inaccurately used in medicine. That which commonly and strictly falls under the appellation of *soap*, is a combination of fixed alkali with an expressed oil. The medical consideration of this substance first to be entered into is, that soap is ready to be decomposed by any acid, however weak; and this circumstance in the quality of soap is of great weight in our judging of its effects in the human body. As, in Dr. Cullen's opinion, the human stomach, in its healthy state, is never without some acid present in it, so it is probable, that any moderate quantity of soap taken into the stomach is always decomposed by the acid of this organ; and this goes so far, that when morbid acidity prevails in the stomach, there is not a more powerful corrector than soap; which is often a more convenient remedy than even common absorbents or simple alkalies. As, under a certain management, soap may dissolve the most part of vegetable or animal concretions, a specious foundation has been laid for supposing its attenuant power with respect to the human fluids; and very possibly it may be of use in resolving the viscidities that may be supposed to occur in the alimentary canal; though, considering the diluted state in which it must be applied, its operation cannot be very powerful; and this will apply more strongly with respect to its effects, as it proceeds farther in the system.

When soap is carried into the blood-vessels, Dr. Cullen says, it may be supposed to have some attenuant power; but yet he holds this to be very doubtful, and asserts that it never can be considerable. "When we consider that it cannot be thrown in, in any large quantity, and that only in some length of time; and when taken in, as it is much divided and diffused over the whole mass of blood; we cannot suppose it to be, in any part of this mass, in such quantity or concentration as could have any effect in resolving viscid concretions even out of the body; and, therefore, we must hold the so-much talked of power of soap, in resolving obstructions, to be very insignificant."

4. It has been commonly supposed, that *sugar* is an attenuant; that is, increases the fluidity of the whole mass, and may obviate and resolve concretions that might or do actually happen in our fluids. Dr. Cullen says, it may be so, but there is no proof yet given of the fact; and there are no experiments, made out of the body, that support the opinion. Its antiseptic powers, fully established, are against those of its being an attenuant. What effects it may have when very largely introduced, or when generated in unusual quantity in the singular case of diabetes, he cannot determine. The noxious qualities that have been sometimes ascribed to it are neither clearly proved nor ascertained; and the experiments of the late ingenious and industrious Dr. Stark do not appear to be complete or conclusive on the subject.

Amongst the *dulcia* forming the class of attenuants, Dr. Cullen enumerates honey, liquorice, and the dried sweet fruits, which, however, are only to be considered in that view as approaching to the nature of sugar, or containing more or less of it in their composition.

ATTOLENS AUREM, (*attollens;* from *attollo*, to lift up); a muscle of the ear, which arises, thin, broad, and tendinous, from the tendon of the occipito-frontalis, from which it is almost inseparable, where it covers the aponeurosis of the temporal muscle; and is inserted into the upper part of the ear, opposite to the antihelix. Its use is to draw the ear upwards, and to make the parts into which it is inserted, tense. It is otherwise named *attollens auriculæ superior*.

ATTOLLENS NARES, a muscle that arises from the ends of the two upper bones of the nose, and, is inserted into the upper part of the *alæ*, pulling the nose upwards when contracted.

ATTOLLENS OCULI, that is, *musculus superior*, or *rectus superior, oculi*. It is also called *superbus*, which signifies proud, because it lies upon the upper part of the globe, and pulls up the eye; which gives an air of haughtiness to the countenance.

ATTONITUS MORBUS, a name given to the *apoplexy* and *epilepsy* by old authors. *Attonitus stupor*, is also a name for the *apoplexy*.

ATTRACTION (*attractio*, from *ad*, to, and *traho*, to draw), that property of matter, by which its particles are made mutually to approach and

adhere to one another. Various are the opinions concerning this subject; but, in effect, they agree in this, that, whatever term or mode of reasoning is used, the end is the meeting of the particles of bodies and their consequent union. *Attraction* is of different kinds in nature, though probably they all depend ultimately on the same principle. There is the *Attraction of Gravitation*, which is that tendency discovered in all bodies toward the centre of the earth. Whatever falls, goes to the earth, as if a load-stone was there to draw every thing to it. This sort of *attraction* is in all our visible system; in the earth, planets, &c. Another kind of *attraction* is that of *magnetism*; this is the particular property of but a small portion of the material world. The *attraction of Electricity* has also its peculiarity, to distinguish it. When one body is supersaturated with electric fire, it will give its superabundance, and draw any body that possesses less than itself, until it makes that equal to itself, and then it does not attract. There is also the *attraction of Cohesion*, or of *Aggregation*. It is that by which two polished surfaces, or certain particles or substances of the same kind adhere when in juxta-position, or near each other. It is this that keeps bodies together, and gives hardness. That this sort of *attraction* may take place, the approaching surfaces must be polished, that all interstices may be filled up. See COHESION. Anothor kind of *attraction* is that called *elective* or *chemical*, because of its importance in chemical operations. By elective *attraction* is meant, that tendency which bodies have, however different, to unite together and become one; forming a body with properties different from those of either of its constituents: as, in the formation of metallic salts, &c. It is this property in matter, by which all the grand appearances in the inanimate world are accounted for, and which, our great countryman Sir Isaac Newton first taught us to reason about with certainty. The substance of what has been digested into order, to support many physical reasonings, may be apprehended from the following propositions.

1. The quantity, or force, of *attraction* in all bodies is exactly proportional to the quantity of matter in the attracting body, as being in reality nothing but the result or sum of the united forces of all those single particles of which it is composed; or, in other words, *attraction* in all bodies is, *cæteris paribus*, as their solidities. Hence, (1.) At equal distances the *attractions* of homogeneal spheres will be as their magnitudes. And (2.) At any distance whatever, the *attraction* is as the sphere divided by the square of the distance.

2. The attractive force is infinitely greater at the point of contact, or extremely near it, than at any determinate distance.—The attractive force exerts itself only where the tendency of a particle another way is overpowered by its proximity to that into whose contact it is supposed to be drawn: for, as this property is universal, and, every part of matter does draw, and, is drawn by every other part of matter, within one another's spheres of *attraction*: so, one cannot influence another at any distance, but, must necessarily be very near it; and, so much the nearer in proportion to its smallness: so that, upon a double account, two particles cannot influence one another by their *attractions*, unless very near; one from their predominant inclinations another way, and the other from the minuteness of their spheres of activity: insomuch that, out of that reach, could they be supposed under no other tendency, they would never come together.

3. A large particle attracts not more strongly than a small one of the same solidity: but, diversity of figure causes different degrees of *attraction* in particles that are otherwise the same.—This is almost a consequence from the former proposition; for, as this attractive force can only act on such particles as are extremely near, the remotest parts in a large particle can produce nothing thereto. And for the same reason this power varies, according as matter is in cones, cylinders, cubes, or spheres; and a spherical particle, *cæteris paribus*, has the stronger *attraction*; as there is more solidity under such a surface, than in any other figure.

4. If particles swimming in a fluid attract one another more strongly than they do the particles of the fluid, the force by which they come to each other, will be as the excess of their mutual *attractions* to their *attractions* of the fluid.—Such parts of the fluid as interpose between the attracting particles will be thrust or pressed upon by such their inclinations to each other; and therefore, according to the nature of fluidity, the parts of the fluid will be driven out of their places by such excess of pressure, and thereby the attracting particles will join.

5. If particles swimming in a fluid are more attracted by the fluid than by one another, they will recede from one another with a force that will be equal to the difference of their mutual *attractions*, and the *attraction* of the fluid.—For the ambient particles of the fluid attracting them more strongly than they do each other, they will, by such excess of force, be drawn from one another into contact and cohesion with the particles of the fluid. Upon the two foregoing points, depends the whole theory of crystallization and solution.

6. The force, by which particles attracting one another cohere, is *cæteris paribus*, in proportion to their contacts.—For those parts not in contact, conduce nothing, or extremely little, to the force of cohesion; and, a much greater power is required to separate two particles which cohere in two points, than two particles which cohere only in one

point: for which reason it is, that we find two polished marbles adhere more strongly than any other two bodies of equal dimensions, which are not so solid, but have more pores and interstices between their parts, and which will not receive so good a polish, by which their parts are brought into so close a contact with one another. And, for the same reason it is, that many light substances have such strong cohesions and tenacities; for that whereby particles of the least matter in proportion to their surfaces, are specifically lightest, also occasions their strongest cohesions, by being capable of more contact than particles of more solidity under less surface.

7. If the attracting particles are elastic, they must necessarily produce an intestine motion greater or less, according to the degrees of their elasticity and attractive forces.—Because, upon the occursions which their attractive powers draw them into, they will fly off from one another again with the same degree of velocity that they met together with, abating for the resistance of the medium; but when they approach other particles in their resilition, their velocity must increase, because they are attracted afresh; and, therefore, meeting a second time, they will recede with a greater velocity than they did at their first concursion; which will continue an intestine motion, as are their attractive powers and elasticities.

8. Particles attracting one another, in a fluid moving either with a swift or a slow progressive motion, attract one another just the same as if the fluid was at rest, if all the particles move equally; but, an unequal velocity of the particles will interrupt their *attractions.*—All the parts of the fluid moving on with equal velocity, leave the attracting particles in the same condition, as if the whole fluid was at rest; but, some parts moving faster than others, must frequently change their positions, and, thereby disturb their *attractions.* Thus it is that salts will not crystallize, till the water in which they are dissolved is nearly or quite cold, and the intestine motion of its particles, caused by heat, is quieted. See the articles Affinity and Elective Attraction.

ATTRITION, (from *ad*, and *tero*, to wear against); a term which expresses such a motion of bodies against one another, as strikes off some superficial particles, by which they become gradually less. It is also frequently used for the friction or rubbing such bodies one against another, as will not wear out, but occasion particular determinations of the fluids they contain: thus, an attrition of the sides of the stomach is supposed to occasion the sensation of hunger. Pain or pleasure, are also produced by this means, in the organs fitted for such impressions. *Attrition* is often used to express a separation of the cuticle from the cutis by compression.

AUANTE, (αυαντη), or auapse, the dry disease. Hippocrates describes it thus: the patient cannot bear either abstinence or eating; fasting causes flatulence and pain in the stomach; he vomits up various matters, and after vomiting is easy. After eating there are eructations, an inflammatory heat and redness; a tenesmus, and great discharge of wind; head-ach; a sense of pricking in different parts of the body; the legs grow feeble and small, and become weak. In order to a cure, Hippocrates directs a purge, and then an emetic; afterwards abstinence from fat food, temperance, bathing, unctions, and moderate exercise.

AUDITORY NERVE. See Nervus Auditorius.

AUDITORY NERVES; *nervi auditorii:* the seventh pair of nerves, which are distributed on the organ of hearing. See Portio Mollis.

AUDITORY PASSAGE. See Meatus auditorius externus and internus.

AUDITUS, the sense of hearing. See Hearing and Ear.

AURA, (αυρα; from αω, *to breathe*); any subtle vapour or exhalation.

AURA EPILEPTICA, a peculiar sensation which is felt by epileptic patients, as if a blast of cold air ascended from the lower parts towards the heart and head. It indicates an approach of the paroxysm.

AURA SEMINIS; the extremely subtle and vivifying portion of the human male semen, that ascends through the Fallopian tubes, to impregnate the ovum in the ovarium of the female.

AURANTIUM, (*ab aureo colore*, from its golden colour); the *aurantium Hispalense*, or Seville orange. The plant which affords this fruit is the *Citrus aurantium*, *petiolis alatis*, *foliis acuminatis*, Linn. Class, *Polyadelphia*. Order, *Icosandria*. The leaves, flowers, and exterior rind are directed for medicinal use. The former possess stomachic and stimulant qualities, but are neither so aromatic nor so bitter as the rind of the fruit. The flowers are highly odoriferous, and in great esteem as a perfume. The taste of these is also somewhat warm, accompanied with a degree of bitterness. They yield their flavour by infusion to rectified spirit, and in distillation both to spirit and water, (*aqua florum naphæ*): the bitter matter is dissolved by water, and, on evaporating, the decoction remains entire in the extract. A fragrant red-coloured oil, distilled from these flowers, is brought from Italy under the name of *essentia neroli;* but oil of behen, in which orange flowers have been digested, is frequently substituted for it. The fraud, however, is easily detected, as the real oil is entirely volatile, and the adulterated is fixed.

The juice of the orange is well known as a grateful acid, and the outer yellow rind of the fruit as a grateful aromatic and bitter substance. The unripe

fruit dried are called Curaçoa oranges. They vary in size from that of a pea to that of a cherry. They are bitterer than the rind of ripe oranges, but not so aromatic, and are used as medicine in complaints of the stomach.

The orange flowers were at one time said to be useful in convulsive and epileptic cases; but experience has not confirmed the virtues attributed to them. By drying they lose their virtues, but these may be preserved by packing closely in earthen vessels, with half their weight of muriate of soda. The juice is of considerable use for allaying heat, quenching thirst, and promoting the salutary excretions: it is likewise beneficial in genuine cases of the sea-scurvy. Although the *Seville orange* has alone a place in our pharmacopœias, yet the juice of the China, or sweet orange, is much more commonly employed. It is more mild, and less acid; and it is used in its most simple state with great advantage, both as a cooling medicine, and as an useful antiseptic. Dr. Wright applied the roasted pulp of oranges as a poultice to fetid sores, in the West Indies, with very great success.

The rind is excellent as a stomachic and carminative remedy; promoting appetite, warming the stomach, and strengthening the tone of the viscera. Orange-peel appears to be considerably warmer than that of lemons, and to abound more with essential oil: to this circumstance, therefore, due regard ought to be had in the use of these fruits. The flavour of the first is likewise supposed to be less perishable than that of the other, but this is doubtful, if not unfounded.

The rind of this fruit enters into many of our officinal preparations, but these are too well known to require a particular description.

AURI'CULA, (from *auris*, the ear), the external part of the ear; which is divided into the upper part called *pinna*, and the lower soft part called *lobus*, or *lobulus*. The pinna is divided into several eminences and cavities; the eminences are the *helix*, called also *capreolus; anti-helix*, or *tragus*, called also *anti-lobium*, and *anti-tragus*. The *helix* is the large border round the ear, or the exterior compass of the ear; so called because of its tortuosity. The *anti-helix* is the large oblong eminence, surrounded by the helix. The *tragus* is the like anterior protuberance, opposite to the lobe, below the fore part of the helix, which in the aged is often covered with hairs. The *anti-tragus* is the posterior extremity of the anti-helix. The name of *anti-tragus* is also given to a muscle which acts only upon the cartilage of the ear.

The cavities are the *scapha*, on the inside of the helix; the *cavitas innominata* or *fossa navicularis*, at the anterior upper part of the anti-helix; the *concha*, which is situated under the anti-helix—there is a sort of *septum* CONCHÆ, which is a continuation of the helix; and the fourth cavity is the *meatus auditorius externus*.

The *auricula* is composed chiefly of cartilage, which gives and preserves its shape. It has the advantage of being variable, for there are certain small muscles called *helicalis major*, and *minor*, *tragicus*, and *anti-tragicus*, which are peculiar to the ear; they are supposed to act only upon the cartilage, and to alter its situation, whence it is supposed that we have the power of receiving more or less sound into the meatus auditorius.

The external ear is fixed to the cranium, not only by the cartilaginous portion of the meatus, but also by the ligaments, viz. the anterior, which is fixed by one extremity to the root of the apophysis zygomatica of the os temporis, close to the corner of the glenoid cavity, and by the other extremity to the anterior and superior part of the cartilaginous meatus. And the posterior ligament is fixed by one end to the root of the mastoid apophysis, and by the other to the posterior part of the concha, so that it is opposite to the anterior ligament. There is also a kind of superior ligament which seems to be only a continuation of the aponeurosis of the frontal and occipital muscles.

The lobe seems to be doubling of the teguments; it is only skin and cellular membrane. For a particular account of the vessels, &c. see AURIS.

AURI'CULA I'NFIMA; the lobe of the ear. It is also the specific name of several herbs, from their supposed resemblance to ears.

AURICULA JUDÆ, or *fungus sambucinus;* a membranaceous fungus; the *peziza auricula; concava rugosa auriformis* of Linnæus, which resembles the human ear. Its virtues are astringent, and it is generally employed, in the form of decoction, as a gargle for sore throats.

AURICULA MURIS. See PILOSELLA.

AURICULÆ CORDIS. At the basis of the heart are observed two muscular bags, which are called its *auricles;* they are joined to the ventricles, into which they have openings. The right *auricle* receives the blood from the vena cava ascendens and descendens, then transmits it to the right ventricle; the left *auricula* receives the blood from the lungs, and sends it into the left ventricle.

AURICULARIS, (*sc.* DIGITUS; from *auris*, the ear); the little finger; so called because people generally put it into the ear, when the hearing is obstructed by accumulated wax.

AURICULA'TUM, or AURI'TUM; (from *auricula*, a little ear); an epithet, applied, in botany, to a leaf which is twisted into the form of a little ear, or having an appendage like an ear. Such leaves are commonly heart-shaped, having the corners prominent and rounded, but with an additional smaller lobe near the base.

AURIGA, a name formerly given to the fourth

lobe of the liver. Also a sort of bandage for the sides, described by Galen.

AURIPIGME'NTUM; yellow orpiment. See ARSENIC.

AU'RIS, (from *aura*, air, as being the medium of hearing); the ear, or organ of hearing. See EAR.

AURISCA'LPIUM, (from *auris*, *an ear*, and *scalpo*, *to scratch)*; an instrument to pick and cleanse the ears from wax, &c.

AURI'TUM. See AURICULATUM.

AU'RUM, gold. See GOLD.

AU'RUM FU'LMINANS, a preparation made by dissolving gold in *aqua regia*, and precipitating it with salt of tartar; whence a very small quantity of it becomes capable, by a moderate heat, of giving a report like that of a pistol. See GOLD.

AUSTERE, a rough astringent taste, by which some vegetable and other substances are distinguished.

AUTOCRATE'IA, a Greek term much used by Hippocrates, and signifying that most wonderful power possessed by the human body, by which it preserves itself from diseases, keeps off many, and in a very short time cures some already begun, while others are, by the same means, more slowly brought to a happy conclusion. This power is otherwise named the *vis medicatrix naturæ*. It is well known both to physicians and philosophers, by whom it is most justly relied on, as being even alone sufficient for the cure of many diseases, and of service in all. The best medicines, indeed, operate only by exciting and properly directing this force; for no medicine will act on dead matter. But though physicians justly put confidence in this power, and though it frequently will cure diseases of a slighter nature, it is not to be thought that those of the more grievous kind are to be left to its unassisted efforts. Physicians, therefore, have a twofold error to avoid, namely, either despising the powers of nature too much, or putting too great confidence in them; because in many diseases these efforts are either too feeble or too violent, insomuch that sometimes they are more to be dreaded than even the disease itself. So far, therefore, is it from being the duty of a physician *always* to follow the footsteps of Nature, that it is often necessary for him to take a directly contrary course, and oppose her efforts with all his might.

AUTO'PYROS, (from αυτος, *itself*, and πυρος, *wheat)*; in the ancient diet, an epithet given to a species of bread, wherein the whole substance of the wheat was retained without retrenching any part of the bran. Galen describes it otherwise, *viz*. as bread where only the coarser bran was taken out. And thus it was a medium between the finest bread, called *similagineus*, and the coarsest called *furfuraceus*. This was also called *autopyrites* and *syncomistus*.

AUTOUR, a sort of bark which resembles the cinnamon, but is thicker and paler; the inside is of the colour of a broken nutmeg, with a multitude of spangles. It is almost insipid, and has no smell at all. It is brought from the Levant, and is an ingredient in the carmine dye.

AUTUMN, (*autumnus*, from *augeo*, to increase); the third season of the year, when the harvest and fruits are gathered in. Autumn begins on the day when the sun's meridian distance from the zenith, being on the decrease, is a mean between the greatest and the least; which in these countries is supposed to happen when the sun enters Libra. Its end coincides with the beginning of winter. Several nations have computed the years by autumns; the Anglo-Saxons, by winters. Tacitus tells us, the ancient Germans were acquainted with all the other seasons of the year, but had no notion of autumn. Autumn has always been reputed an unhealthy season. Tertullian calls it *tentator valetudinum*: and the satyrist speaks of it in the same light.—*Autumnus Libitinæ questus acerbæ*. The most common disease that prevails at this season is the dysentery.

AUTUMNA'LES PLANTÆ, (from *autumnus*, autumn), plants that flower in autumn. These constitute the third division in Du Pas's arrangement, from the time of flowering.

AVE'NA, (from *aveo*, *to covet*, because cattle are very fond of them), the oat; *Avena sativa*, Linn. There are two kinds of oats, the black and the white; they have similar virtues, but the black are chiefly sown for horses. They are less farinaceous and less nourishing than rice or wheat, yet afford a sufficient nourishment to as active and vigorous a people as the world produces; *viz*. the Highlanders in the north of this island. Gruels made with the flour or meal, called oatmeal, digest easily, have a soft mucilaginous quality, by which they obtund acrimony, and are used for common drink and food in fevers, inflammatory disorders, coughs, hoarseness, roughness, and exulceration of the fauces, &c. Water-gruel answers all the purposes of Hippocrates' ptisan. Externally, poultices with oatmeal, vinegar, and a very little oil, are good for sprains and bruises. *Stimulant* poultices, with the grounds of strong beer, mixed up with oatmeal, are made for tumors, &c. of a gangrenous tendency.

AVE'NA SATI'VA; the systematic name for the *avena* of the pharmacopœias. See AVENA.

A'VENS, COMMON. See CARYOPHYLLATA.

AVENZOAR, *(Abu Merwan Abdalmalec ebn Zohr)*, an eminent Arabian physician, flourished about the end of the eleventh century. He was of noble descent, and born at Seville, the capital of

Andalusia, where he exercised his profession with great reputation. Dr. Freind writes, that he lived to the age of 135; that he began to practise at forty, or (as others say) at twenty; and had the advantage of a longer experience than almost any one ever had, for he enjoyed perfect health to his last hour. He was cotemporary with Averroes, who, according to Leo Africanus, heard the lectures of Avenzoar, and learned physic of him: this seems the more probable, because Averroes bestows on his instructor very high encomiums, calling him *the most supreme in physic from the time of Galen.* Avenzoar, notwithstanding, is by the generality of writers reckoned an empiric; but Dr. Freind observes, that this character suits him less than any of the rest of the Arabians; for he had a regular education, and not only learned what properly belongs to a physician, but, out of a pure desire of knowledge, every thing besides which related to pharmacy and surgery. He was averse also to quackery, rejected the idle superstitions of astrologers, and throughout all his works, professes himself of the dogmatical or rational sect, which was directly opposite to the empirical. He wrote a book "On Medicines and food;" wherein he treats of the qualities of both.

AVERRO'ES, an Arabian philosopher and physician, who was a native of Corduba, and flourished in the twelfth century at the court of Morocco. With other sciences, to which he was more particularly devoted, he studied natural philosophy, medicine, astrology, and mathematics, but understood the theory of medicine much better than the practice. See AVENZOAR.

AVICE'NNA, a celebrated Mahommedan philosopher and physician, born in the year 980. Amongst his numerous writings was an Encyclopœdia, in twenty volumes, composed when he was little more than as many years old; it was quaintly, but not unappropriately, entitled, "*The Utility of Utilities.*" His knowledge of medicine, however, was insufficient to counteract the inroads which his constitution suffered from an irregular life. He died at Hamadan, at the age of 58, in the 428th year of the Hegeira, and of Christ 1036.

AVICE'NNIA, a genus in Linnæus's botany. He enumerates two species.

AVICE'NNIA TOMENTO'SA; the systematic name for the plant which affords the anacardium of the pharmacopœias. See ANACARDIUM ORIENTALE.

AVIGA'TO PEAR, a fruit of the *laurus persea* Linn. When perfectly ripe, it melts in the mouth like marrow, which it is said also greatly to resemble in flavour. It is also supposed to be the most nutritious of all the tropical fruits, and grows in vast abundance in the West Indies and in New Spain. The unripe fruit of this tree has but little taste; yet being very salubrious, it is often eaten, with salt and pepper, by the sailors, when they arrive at the Havannah and those parts. They purchase these pears in great quantities; and, chopping them into small pieces with green capsicums and a little salt, regale themselves heartily with them. They are esteemed also for their antidysenteric qualities, and are prepared in a variety of ways for the tables of the opulent.

AXAYACATL, the name of a species of fly, common in Mexico, about the Lake; the eggs of which, being deposited in immense quantities, upon the rushes and corn-flags, form large masses, which are taken up by fishermen and carried to market for sale. This caviare, called ahuauhtli, which has much the same taste with the caviare of fish, used to be eaten by the Mexicans, and is now a common dish among the Spaniards. The Mexicans eat not only the eggs, but the flies themselves, made up together into a mass, and prepared with saltpetre.

AXI'LLA, the cavity under the upper part of the arm, called the arm-pit.

AXI'LLA, in botany, an arm-pit; that angle which is formed by the branch and stem, or by the leaf with either. The leaves of a plant are said to be axillary, when they proceed from the angle formed by the stem and branch.

AXILLA'RIS ARTE'RIA; the subclavian artery having left the thorax immediately above the first rib, in the interstices between the portions of the scalenus muscle, there receives the name of axillary, because it passes under the axilla. See ARTERIES.

AXILLA'RIS NERVUS, the axillary nerve; also called the articular nerve. It arises from the last two cervical pairs; it runs in the hollow of the axilla, behind the head of the os humeri, between the musculus teres major, and minor, and turns from within outwards and backwards, round the neck of the bone, and runs to the deltoid muscle.

AXILLA'RIS VENA, the axillary vein. It is the continuation of the subclavian vein, in its passage out of the thorax to the opposite side of the axilla. See VEINS.

AXIOM, (*axioma*, from ἀξιοω, *I am worthy);* a self-evident truth, or a proposition whose truth every person receives at first sight. Thus, that the whole is greater than a part; that a thing cannot be and not be at the same time; and that from nothing, nothing can arise; are axioms. An axiom is also an established principle in some art or science. Thus, it is an axiom in physics, that nature does nothing in vain; that effects are proportional to their causes, &c. So it is an axiom in geometry, that things equal to the same third are also equal to one another; that if to equal things you add equals, the sums will be equal, &c. It is an axiom in optics, that the angle of incidence is equal to the angle of reflexion, &c.

AXIRNACH, a name for the superfluous fat found sometimes in the upper eye-lids of children.

A'XIS, (from *ago*, to act); that round which any thing revolves, or is supposed to revolve. It also expresses that quiescent right line of a vessel or canal, which is always equi-distant from its sides.

A'XIS, in botany, is a taper column placed in the centre of some flowers or catkins, about which the other parts are disposed regularly.

A'XIS, the name of the second vertebra (according to some, of the first, and to others the third) of the neck, reckoning from the head downwards. This second vertebra has a tooth which goes into the first vertebra, and this tooth is by some called the axis, by others the axle.

A'XIS ARTERIÆ CŒLIACÆ, i. e. Cœliaca Arteria. See Arteries.

AXU'NGIA, (from *axis*, an axle-tree, and *unguo*, to anoint, alluding to its vulgar uses); lard, or fat. See Fat.

A variety of substances of this kind were introduced by the Arabians, and recommended as possessing distinct virtues. Experience, however, does not countenance these different virtues ascribed to different fats. They have all one common emollient quality, relax the part to which they are applied, and prevent perspiration: these effects, with the consequences of them, may be expected in a greater or less degree from fats of every kind. The London College has therefore retained only two fats, of different consistencies, for different mixtures, viz. hog's-lard and mutton-suet. These are certainly sufficient for answering all the intentions for which substances of this kind are employed, and are therefore exclusively used in pharmacy.

AXY'RIS; a genus of the triandria order, belonging to the monœcia class of plants; and in the natural method ranking under the 12th order, *holoraceæ*. The calyx of the male is tripartite; it has no corolla. The calyx of the female consists of two leaves; it has two styli and one seed. The species are four, none of them natives of Britain.

AYE'NIA, in botany, a genus of the pentandria order, belonging to the gynandria class of plants; and in the natural method ranking under the 37th order, *columniferæ*. The calyx has two leaves; the petals are in the form of a star, with long ungues; and the capsule has five cells. There are three species, all natives of the West Indies.

AYTO'NIA, in botany, a genus of the monadelphia order, belonging to the pentandria class of plants, the characters of which are: the calyx is quinquepartite; the corolla consists of four petals; the berry is dry, quadrangular, unilocular, and many-seeded. There is but one species, the capensis, a native of the Cape, but of which we have not been able to find any particular description.

AZORIAN FENNEL. See the article Finocchio.

A'ZOT, (*azotum*, from *α*, priv. and *ζεω*, *to live*; because it is unfit for respiration); an elastic fluid which enters into the composition of our atmosphere. See Atmosphere.

That air, which has served the purposes of combustion and respiration, is no longer proper for those uses, is a fact that has been long ascertained; and the air thus corrupted has been distinguished by the names of *phlogisticated air*, *mephitised air*, *atmospherical mephitis*, &c. But, in the new nomenclature of chemistry, it is denominated *azot*, or *azotic gas*; and Mr. Chaptal has given it the name of *nitrogene*, which is reckoned still more proper.

This gas, which is the residue of combustion or respiration, is always mixed with a small quantity of vital air and carbonic acid, which must be removed in order to have the azotic or nitrogene gas in a state of purity. There are several methods which may be used to obtain this gas, in a very pure state. It has been proposed by Mr. Scheele to obtain this air by exposing sulphate of potass, or liver of sulphur, in a vessel filled with atmospherical air, as the vital air, on being completely absorbed, leaves the nitrogene gas pure. By exposing, in atmospherical air over mercury, a mixture of iron and sulphur, kneaded together with water, Mr. Kirwan obtained azotic or nitrogene gas so pure, that it suffered no diminution by nitrous gas. He deprived it of all humidity, by successively introducing dried blotting-paper into the vessel which contained it. Care must be taken to withdraw this air from the paste which affords it, otherwise it will be mixed with hydrogene or inflammable gas, which is afterwards disengaged. When by any means, such as the oxidation of metals, the rancidity of oils, the combustion of phosphorus, &c. the vital air of the atmosphere is absorbed, the residue is azotic or nitrogene gas. All these processes afford methods of greater or less accuracy for the determination of the proportions of vital air and azotic or nitrogene gas in the composition of the atmosphere.

It has also been found that this mephitis can be procured by treating muscular flesh, or the well-washed fibrous part of blood, with nitric acid in a proper machine or apparatus. But it must be carefully observed that these animal matters ought to be fresh; for if they have begun to be changed by the putrid fermentation, they afford carbonic acid mixed with hydrogene gas. This gas has been found to be improper for respiration and combustion; but plants can live and vegetate freely in it; and it mixes with the other airs, without combining with them; but is lighter than the atmospheric air. The barometer standing at 30. 46, and Fahrenheit's thermometer at 60: the weight of nitrogene gas has been determined to be, to that of common air, as nine hundred and eighty-five to one thousand. When mixed with vital air, in the proportion of

72 to 28, it constitutes our atmosphere. The other principles which analysis has demonstrated in the atmosphere, are only accidental, and by no means essential to it. But in order to give a more perfect idea of azotic or nitrogene gas, it may be necessary to mention a few of its properties. From its being somewhat lighter than common air, it occupies the upper part of rooms in which the air has been altered by combustion or respiration. But though so noxious to animals in the state of elastic fluidity, the azotic principle, its base, is one of the component principles of animal bodies; from which it may be extracted in great abundance. It is likewise one of the constituent parts of ammonia or volatile alkali, and of the nitric acid. It appears to be absorbed by vegetables, and perhaps also by animals. It is highly probable too that the same principle enters into the composition of all alkaline bodies, and may be considered as a genuine alkaligenous principle, in opposition to the base of vital air, to which the name of oxigene, or the oxigenous principle, has been given.

Under the article ATMOSPHERE, we have spoken generally of its phenomena, and of the ill effects of a vitiated air; but we here propose to consider it in a chemical point of view. A very slight knowledge of chemistry will inform us, that gaseous substances seldom exist alone and insulated; but that nature presents them every where to our observation in a state of mixture or of combination. In the first case, these gases preserve the aëriform state; in the second, they for the most part form fixed and solid bodies. Nature, in her several decompositions, reduces almost all the principles of bodies into gas; and these new substances unite together, combine, and from thence result compounds of considerable simplicity in their principles, but which become complicated by subsequent mixtures and combinations. It has been shewn, that the mixture of about seventy-two parts of azotic or nitrogene gas, and twenty-eight of oxigene, forms the fluid mass in which animals live. These two principles are so well mixed, and each of them is so necessary to the support of the various functions of individuals which live or vegetate upon the globe, that they have not yet been found separate and distinct from one another. But the proportion of these two gases is subject to variation in the mixture which forms the atmosphere: this difference, however, depends only upon local causes; and the most general proportion is that which has been mentioned above. The properties which form the characteristic of vital air are modified by those of azotic or nitrogene gas, and these modifications would seem to be essentially necessary; for if vital air, in its sate of purity, were to be constantly respired, it would quickly consume and destroy life; this pure air is therefore no more suited to our existence than distilled water. Nature seems not to have designed all animals for the use of these principles in their greatest degree of perfection. It is well known, that the atmospherical air is elevated several leagues above our heads, and that it fills the deepest subterraneous cavities. It is invisible, insipid, inodorous, ponderous, elastic, &c. This was the only gaseous substance known before the present era of chemical science; for the infinite gradations of all the invisible fluids which presented themselves to the observation of philosophers were constantly attributed to different modifications of this air.

B

BA'CCA, a berry; according to Linnæus, is a pulpy *pericarpium*, or seed-vessel without a valve, inclosing several seeds which are naked. The seeds are sometimes dispersed promiscuously through the pulp, as in the water-lily; but generally placed on receptacles or foot-stalks within the pulp, as in the currant, gooseberry, raspberry, &c.

We find in the lesser burdock, *xanthium*, that the seed-vessel, which is improperly called by Linnæus a berry, is dry, and contains within it a nut furnished with two cells. Nor has the seed-vessel or fruit of the *capsicum*, which the same author also styles a berry, any pulp; and it is hollow within.

Dr. Milne contends, that from these and other instances, we may safely affirm, either, that the definition of a berry just now given is imperfect, or that the seed-vessels of a great number of plants in the *Genera Plantarum*, are wrongly denominated berries. It is sometimes difficult indeed, to refer a pericarpium to the head of *bacca*, or *dupra*, as defined by Linnæus. The only difference betwixt these seed-vessels consists in the nature of the seeds inclosed within the pulp. In the latter is inclosed a nut, or stone; in the former, a number of naked seeds. The very different fruits, or rather seed-vessels of the sumach; night-shade, *solanum;* sow-bread, *cyclamen;* medlar, *mespilus;* orange, *citrus;* and pine-apple, *bromelia;* are all denominated berries.

A berry is commonly round or oval, and frequently furnished, like the apple, and other similar fruits, with an *umbilicus* or small cavity, at the end opposite to the foot-stalk. It is said to be *proper*, when formed of the pericarpium or seed-vessel; *improper*, or *singular*, when formed of any of the other parts.

The latter formation, however, is frequent, and admits of numerous varieties, of which the following are the most considerable: In the mulberry, rose, blite, and myrtle-leaved sumach, *coriaria;* a large, fleshy and succulent calyx becomes a berry. In the strawberry and cashew nut, *anacardium;* a berry is formed of the common receptacle; in the raspberry and adonis, of a seed; in marvel of Peru, *mirabilis*, of the *nectarium;* (See NECTARIUM) in garden-burnet, *poterium*, of the tube of the corolla, which hardens and shuts for that purpose; in spindle-tree, *euonymus*, of a succulent *arillus*, or proper seed-covering. See ARILLUS.

The berry does not naturally gape, or burst; the dispersion of the seeds within the pulp being designed to be performed by means of animals, which, after eating the fruit, expel them with their dung.

BA'CCÆ BERMUDE'NSES. See SAPONARIÆ NUCULÆ.

BA'CCÆ NORLA'NDICÆ; the berries of the *Rubus arcticus; foliis alternatis, caule inermi unifloro*, Linn. They are recommended by Linnæus as possessing antiseptic, refrigerant, and antiscorbutic qualities.

BACCI'FERÆ HERBÆ, (from *bacca*, a berry; and *fero*, to bear); herbs that have a berry for their *pericarpium* or seed-vessel. These constitute the sixteenth class in Morrison, the seventeenth in Hermannus, the first in Christ. Knaut, the twenty-fifth in Boerhaave, and seventeenth in Ray's Method. It consists, in some systems, of all such plants as have a pulpy fruit, whether of the apple, berry, or cherry kind; in others, with more propriety, of such only as have that species of pulpy pericarpium, called *bacca.* See BACCA.

BACHER'S PILLS; a celebrated medicine in France, employed for the cure of dropsies. Their principal ingredient is the extract of *melampodium*, or black hellebore. See ASCITES.

BADIA'GA, in the materia medica, the name of a sort of spongy plant, common in the shops in Moscow, and some other northern kingdoms. The use of it is to take away livid marks from blows or bruises, which the powder of this plant is said to do in a night's time.

BADIA'NE, or BANDIAN, the seed of a tree which grows in China, and smells like aniseed. The Chinese, and the Dutch in imitation of them, sometimes use the badiane to give their tea an aromatic taste. See ANISUM STELLATUM.

BÆCKEA, in botany; a genus of the octandria order, belonging to the monogynia class of plants. The calyx is a permanent perianthium, consisting of a single funnel-shaped leaf, cut into five segments at the brim; the corolla consists of five roundish spreading petals inserted into the calyx; the pericarpium is a globose capsule, made up of four valves, and containing four cells, in which are a few roundish angular seeds.

BAGLI'VI, a physician of Italy, was a native of Apulia, and born about the year 1668. He studied at Padua, where he became doctor, and then went to Rome, where he was chosen professor of anatomy. He was a man of most uncommon force of understanding, of which he gave ample proofs in many curious and accurate productions, philosophical as well as medicinal. He died at Rome 1706, at the age of 38. A collection of his works was printed first in 1710, quarto; and has since been reprinted, in the same size, at various places. His *Praxis Medica*, and *De Fibra Matricis*, are the principal pieces.

BAGNIGGE WELLS; a mineral spring in Middlesex. These wells are situated at the bottom of the hill on the South West side of Islington. The water is clear, and tastes slightly brackish, like a weak solution of Epsom salt. From a gallon of this water evaporated, were got, by chemical analysis, 135 grains of insoluble earth, 257 of bitter purging salt, mixed with a marine salt, from whence they derive their purging quality. Dr. Monro also thinks it probable, that the salt of this water is chiefly an Epsom salt, mixed with a good deal of a bittern; because it easily attracts moisture, and is very difficult to crystallise. In his treatise on mineral waters, Dr. Saunders, of London, classes it amongst the *simple saline waters*, which contain a great quantity of *Epsom salt.* In most constitutions three half pints is considered a full dose for purging.

BA'GNIO, an Italian word, signifying *a bath.* We used to apply the term to a house, with conveniences for bathing, cupping, sweating, and otherwise cleansing the body; and sometimes for immoral purposes. In Turkey it is become a general name for the prisons where the slaves are inclosed, it being usual in these prisons to have baths.

BALAUSTINE FLOWERS. See GRANATUM.

BALAU'STIUM, the balaustine flower. A large rose-like flower, of a deep red colour; the produce of the plant from which we obtain the *granatum.* See GRANATUM.

BALBU'TIES, (from *balbus*, stammering); a defect of speech, and properly that sort of stammering where the patient sometimes hesitates, and immediately after speaks precipitately. See PSELLISMUS.

BALDMONEY. See MEUM ATHAMANTICUM.

BALM. See MELISSA.

BALM OF GILEAD. See MOLDAVICA.

BALM OF GILEAD FIR. See BALSAMEA.

BALM OF MECCA. See BALSAMUM GILEADENSE.

BALM, TURKEY. See MOLDAVICA.

BA'LNEUM, a bath. See BATH.

BA'LNEUM ARE'NÆ, a sand bath for chemical purposes. See BATH, CHEMICAL.

BA'LNEUM MARI'Æ. See BATH, CHEMICAL.

BA'LNEUM MA'RIS. The same as *balneum mariæ*. See BATH, CHEMICAL.

BA'LNEUM SI'CCUM. See BATH, CHEMICAL.

BA'LLON, or *Balon*, (Fr.) a BALLOON: a large glass receiver in the form of a hollow globe. For particular chemical operations *balloons* are made with two necks placed opposite to each other; one to receive the neck of a retort, and the other to enter the neck of a second *balloon:* this apparatus is called *enfiladed balloons*. Their use is to increase the whole space of the receiver, because any number of these may be adjusted to each other. The only one of these vessels which is generally used, is a small oblong *balloon* with two necks, which is to be luted to the retort, and to the receiver or great *balloon;* it serves to remove this receiver from the body of the furnace, and to hinder it from being too much heated. See CHEMICAL APPARATUS.

BALSAM, (*balsamum*, from *baal samum*, Heb.) a name given to certain resinous, and odorous substances, procured by making incisions in the outer bark of trees or plants. They are originally liquid, but somewhat thick, and in some instances flow spontaneously from the plant which produces them. These are called natural balsams, to distinguish them from pharmaceutical or chemical compositions that bear the same name.

Balsams are only RESINS in their liquid state, though they are often found to be combined with a considerable portion of gum, in which state they are called *gum-resins*. Resins not so combined are only soluble in vinous spirits and oils. They cannot be dissolved by water, nor are they volatile in the heat of boiling water; but they are fusible in a small degree of heat, and readily inflammable on the contact of any flaming or ignited body. Balsams which are of the nature of gum-resins can only be dissolved by a mixture of spirit and water.

Balsams, by the yolk of eggs, are rendered soluble in water; more elegantly still by sugar; and most elegantly, as essential oils also are, by the intervention of gums and mucilages. Solutions prepared in the latter way are most permanent, as gum is the medium employed by nature herself to unite the resinous with the watery juices of vegetables. Of themselves, balsams have no smell; but they often retain a part of the odorous principle; and in fact they derive both their liquidity and smell from a greater or less quantity of essential oil, which they contain, and which may be separated from them by distillation. According to Neumann and other chemists, balsams may even be considered as true essential oils, which have lost some of their odoriferous principle, and most volatile parts. When they are deprived of their remaining part of volatile oil, their *residua* exactly resemble those which remain after the rectification of essential oils. These *residua* are true resins, from the analysis of which the same principles are obtained as from natural resins, which are themselves nothing else but balsams exhausted by time, or, by the action of the air and of the sun, of all their odoriferous and volatile parts.

Balsamic medicines are warm and stimulating. Under this denomination come what we commonly call nervous antiparalytic medicines, as also many cordial tinctures and other compounds of similar properties. The principal medicines belonging to the balsamic class, which are retained in our modern pharmacopœias, are amber, benzoin, storax, the balsams of Peru and Tolu, &c. &c. But though many writers have considered that class of remedies which we call balsams as of great service in medicine, yet there are others who entertain great doubts of their efficacy. And indeed it must be admitted, that where they are designed to act locally, as on the lungs for instance, balsamics labour under a most important defect; for they must take a most extraordinary circuit in most instances, before they can arrive at the intended scene of action; by which means they not only come slowly, and in small quantities, but much weakened by the action of the stomach and blood-vessels, and by the intermixture of other fluids. In the intentions where balsams are chiefly given, the seat of the disorder is generally in the *viscera;* where a medicine can only arrive by the common conveyance of the blood; and how long, from its being taken into the stomach, must such a medicine be, and how many alterations must it undergo in the distant parts of the body it passes through, before it comes to the part affected! Though the lungs are, by their situation, so near the stomach, a medicine cannot arrive there till it has taken its course through the lacteals, passed all the meanders of the mesentery, gone up with the chyle into the subclavian vein, and then entered the blood: and, after all, it has only the chance of coming to the part in such a quantity, as with regard to the whole medicine which entered the blood, bears the same proportion as the blood in the pulmonary artery bears to all the blood in the other arteries. These considerations led the bishop of Cloyne to prefer tar-water to all other balsamics; but, notwithstanding this reasoning on the subject, we know, from experience, that, let their *modus operandi* be what it may, the stimulating gums, or the balsams prepared from them, are capable of doing considerable

service in the treatment of diseases, those arising from debility more especially.

BALSAM, ARTIFICAL; a certain compound of medicines thus termed from being made of a balsamic consistence and fragrance. They are generally composed of expressed or ætherial oils, resins, and other solid bodies, which give them the consistence of butter or treacle. The basis, or body of them, is expressed oil of nutmeg, and frequently wax, butter, &c. They are usually tinged with alkanct or saffron.

BALSAM, NATURAL; those resins which have not yet assumed the concrete form, but still continue in a fluid state. Materia Medica writers have called them natural balsams. Thus the common turpentine, balsamum copaiva, peruvianum, tolutanum, &c. come under this description.

BALSAM APPLE, MALE; the MOMORDICA of Linnæus. It is a genus of the monœcia syngenesia class. It has male and female flowers upon the same plant; and the male flowers have an open concave empalement of one leaf. It has three short awl-shaped stamina, which are compressed in a body, and have a reflected line containing the farina. The female flowers have the same empalement and petal as the male, but sit upon the germen: these have three short filaments, without summits. The germen supports one taper trifid style, crowned by three oblong, gibbous stigmas, and afterwards turns to an oblong fruit, opening with an elasticity, having three membranaceous cells filled with compressed seeds. Linnæus enumerates eight species, one of which is known by the name of the *wild*, or *spurting cucumber*, from its casting out its seeds, together with the viscid juice in which they are lodged, with a violent force, if touched when ripe; and from hence it has sometimes obtained the name of *noli me tangere*, or *touch-me-not*. This plant grows naturally in some of the warm parts of Europe; but in England it is cultivated for the fruit, which is used in medicine, or rather the *fæcula* of the juice of the fruit, which is the *elaterium* of the shops. See ELATERIUM.

BALSAM OF SULPHUR. See SULPHUR.

BALSAM, TURKEY. See MOLDAVICA.

BALSAMA'TIO, balsamation, a term used by some writers for the art, or act, of embalming a dead body. See EMBALMING. Dr. Hook speaks of an universal balsamation, or method of preserving all kinds of bodies from corruption, invented by Dr. Elshot.

BALSA'MEA; the balm of Gilead fir. The tree formerly so called in the pharmacopœias, is the *pinus balsamea*, Linn. It affords the Canada balsam. See BALSAMUM CANADENSE.

BALSAMELÆ'ON, a name given by some authors to the balm of Gilead, or true balsamum judaicum.

BALSA'MICA, (a Latin word which signifies *mitigating)*; BALSAMICS. The term balsamic is a very lax one; it includes medicines of very different qualities, as emollients, detergents, restoratives, &c. but in medicines of all these kinds there seems to be this requisite understood, *viz.* that they be soft, fragrant, and adhesive, also that by their stimulus they have a disposition to invigorate. Medicines of this tribe are generally required for complaints whose seat is in the viscera; and as they cannot be conveyed there but by the common road of the circulation, it follows, that no great effects can be expected from them but by their long continued action on the first passages.

Hoffman calls by the name of *balsamics*, those medicines which are hot and acrid, and also the natural balsams, stimulating gums, &c. by which the vital heat is increased. Dr. Cullen speaks of them under the joint title of "*Balsamica et Resinosa.*" He says, "with respect to the *balsamica*, as I have said that all of them have for their basis a turpentine, so it may be presumed that all the balsams may have the same diuretic quality which we find in the most simple turpentine. This we have said before to be commonly determined to the kidneys, operating there more or less as a diuretic; and therefore the general title of Balsamica is properly enough inserted in our Catalogue. I must however observe with regard to them, that they cannot possibly be introduced into the body in such quantity as to operate powerfully in any diseases requiring a large discharge of urine.

"The diuretic substance afforded by turpentine, which has been the most taken notice of, is the essential oil obtained by a distillation with water. In attempting the cure of sciatica by this oil, I have frequently observed its passing by the kidneys, and promoting the secretion of urine; but it can never be introduced in such quantity as to be powerful in this way.

"This observation applies to the oleum juniperi, which has been often employed as a diuretic; and it will readily appear, as this oil is drawn from the terebinthinate substance of the juniper, it can hardly have more power than that drawn from the turpentine itself.

"On the subject of the balsamica, I have conceived an opinion which I have in some measure explained already (see the article BENZOINUM), amounting to this, that the acid found in the benzoine exists in the oils of turpentine and of the other balsams; and that upon this particularly depends their diuretic virtues. It is therefore that several of the substances inserted under the title of the Stimulantia Resinosa might have also been inserted in our catalogue of diuretics; but their power is not so considerable as to deserve our attention here or in practice."

BALSAMI'TA MAS; *tanacetum hortense* or *costus hortorum;* the herb COSTMARY, or *alecost.* The

plant which bears this name in the pharmacopœias, is the *tanacetum balsamita; foliis ovatis, integris serratis* Linn. It is a fragrant herb, in smell somewhat like mint. It was formerly esteemed as a corroborant, carminative, and emmenagogue.

BA'LSAMUM FŒMINA. See AGERATUM.

BA'LSAMUM AMERICA'NUM. See BALSAMUM PERUVIANUM.

BA'LSAMUM BRASILIE'NSE. See BALSAMUM COPAIVÆ.

BA'LSAMUM CANADENSE; CANADA BALSAM. It is one of the purest kinds of turpentine, procured from the *pinus balsamea* of Linnæus, and imported from Canada. For its properties see TEREBINTHINÆ.

BA'LSAMUM COPAI'VÆ; *Balsamum brasiliense; Balsamum copaibæ; Balsamum de copaibu;* vulgarly called *capivi;* is a yellow resinous juice, of a moderately agreeable smell, and a bitterish biting taste, that remains a long time in the mouth. It is obtained from the *Copaifera officinalis* Linn. Class, *Decandria.* Order, *Monogynia,* by making deep incisions near the base of its trunk. The juice flows so freely as to afford twelve pounds in three or four hours. It is brought to us from Brasil in earthen bottles. There are two sorts, the one bright and thin, the other thick; the first white, of a resinous smell; the other a little more on the yellow. Both are useful in medicine: the Jews use this balsam after circumcision to stop the blood. Many of the Americans call all odoriferous resins, and sweet scented gums, copal; and the word *iba,* or *iva,* is the name for a tree; by which the etymology of copaiva easily appears. Having the property common to all terebinthinates of getting into the urine in an unaltered state, and possessed of all its astringent and stimulating properties, it is given internally in the cure of gleets, *fluor albus,* &c. It also possesses the usual properties of the balsams, and is, therefore, very advantageously administered in coughs and other pulmonary affections. Its heat and acrimony, however, render it hurtful in all inflammatory cases, and it is sometimes liable to produce very alarming effects when given too largely in urinary complaints. The balsam of copaiva is frequently adulterated with olive oil, and oil of turpentine: indeed, the near resemblance it bears to this last, has occasioned them to be sometimes confounded; though they may be easily distinguished both by their consistence and colour; turpentine being thicker, and of a vitreous cast, and the balsam more inclining to yellow. It is also more odorous, as well as sharper and more bitter to the taste.

This balsam yields a very large proportion of essential oil, by distillation with water, even to the quantity of five or six ounces from a pound; and the chemists who know this, adulterate their oils, either by mixing them with the oil of copaiva, or more artfully, by putting a proper quantity of this balsam with the ingredients into the still, and so drawing off the oil of both mixed intimately together; and there seems no easy way of detecting this fraud. See COPAIFERA. Balsam of copaiva has been employed by way of injection, not only in gonorrhœa and fluor albus in women, but also in the former disease in men. The nature of this remedy sufficiently points out the impossibility of using it, in either case, where not only no inflammation exists, but where the parts are in want of a stimulus. When used in this way, it must first be incorporated with mucilage, and afterwards diluted with water.

BA'LSAMUM GILEADE'NSE, otherwise named *balsamum de Mecca, balsamum meccanum,* or *balsamum verum;* balsam, or BALM, of Gilead. This resinous juice is obtained by making incisions into the bark of the *Amyris gileadensis; amyris foliis ternatis integerrimis, pedunculis unifloris lateralibus* Linn. Class, *Octandria.* Order, *Monogynia.* The fruit of this tree is termed *carpobalsamum* in the pharmacopœas; and the wood or branches, *xylobalsamum.*

The balsam of Gilead, as a popular medicine, has been held in the greatest esteem, though there are some who hold that of Peru to be equal to it in virtue. In the East it is held so precious, that it makes part of the special revenue of the Grand Signior, without whose permission, Dr. Lewis asserts, none of the trees are allowed to be planted or cultivated. Its smell is agreeable, and very brisk; its taste bitter, sharp, and astringent; it easily dissolves in the mouth, and leaves no stain on woollen cloth.

There are three ways of obtaining it, and according to these there are three kinds of the balsam. The first kind is that obtained from the natural cracks or wounds made in the bark, as by the ancients, which is the best and most genuine kind: but there is so little procured in this way, that it scarcely supplies the seraglio, and the great officers, and hardly a drop of it is ever sent out of the country. The second kind is called by some the Constantinople balsam; this also rarely comes to us, unless in small quantities presented by the great men of the Porte. It is prepared by boiling. They fill large vessels with the young twigs and leaves of the shrub; and adding a large quantity of water, they boil them gently. During the boiling, there arises to the surface of the liquor an oily and balsamic matter, which they skim off and preserve for use. After all this fine matter is raised, they increase the fire, and a large quantity of somewhat thicker balsam rises, more like turpentine; this they also separate, and preserve by itself; and this is principally what is imported into Europe.

It is unquestionably a good medicine. It is of the same use with capaiva in gleets, and in some complaints of the kidneys, and is by some persons thought of so much efficacy in diseases of the lungs, as to be esteemed a cure for consumptions. But though it does not absolutely deserve that title, yet with proper management it may do great service in them. Externally, it has also been of considerable use to surgeons, in the cure of ulcers, &c.

For internal use it should be given in boluses, or else dissolved by triture with the yolk of an egg, in the form of a mixture.

There is likewise a balsam of Mecca, which is a dry white gum, especially when kept till it is very old. It is brought from Mecca, by the return of the caravans of pilgrims and Mahometan merchants, who travel thither, out of devotion to the birth-place of their prophet. It has all the virtues of the balsam of Gilead, or of Judea; and is probably the same, only hardened, and its colour somewhat altered.

BA'LSAMUM LUCATELLI, so called from its inventor *Lucatellus;* an old and not ineffectual, though nauseous, remedy for coughs of long standing. The College have lately rejected it from their pharmacopœia. It is composed of oil, two parts, and turpentine and wax, of each one part; with some red sanders to colour and improve its smell.

BA'LSAMUM DE MECCA. See BALSAMUM GILEADENSE.

BA'LSAMUM MEXICA'NUM. See BALSAMUM PERUVIANUM.

BA'LSAMUM MYRO'XILI PERUI'FERI. See BALSAMUM PERUVIANUM.

BA'LSAMUM PERUVIA'NUM, BALSAM of PERU, procured from the *Myroxylon Peruiferum*, Linn. Class, *Decandria.* Order, *Monogynia.* Nat. Ord. *Lomentaceæ.* This tree grows in the warmest provinces of South America, and is remarkable for its elegant appearance. Every part of it abounds with resinous juice; even the leaves being full of transparent resinous points like those of the orange tree.

Balsam of Peru, is of three kinds; or rather, it is one and the same balsam, having three several names: 1. *Balsam of incision,* which is a white glutinous resin, oozing from an incision in the tree, and afterwards thickened and hardened. This is excellent for the cure of ill-conditioned ulcers, and much resembles the *opobalsamum,* except in smell, which distinguishes it. 2. *Dry balsam,* which is distilled from the tips of branches cut off, to which are fastened little vessels to receive the liquor. This at first is like milk, but hardens by being exposed to the sun. 3. The *balsam by lotion,* which is blackish, and is drawn from the bark, roots, and leaves of the tree, bruised and boiled together. This is also used for the cure of wounds like the white balsam; and, on account of its excellent smell, by the perfumers.

The virtues of this balsam as a cordial, pectoral, and restorative, are very great. It is given with advantage from five to ten drops for a dose, in consumptions, asthmas, nephritic complaints, obstructions of the *viscera*, and suppressions of the *menses.* It is best taken dropped upon sugar: the yolk of an egg, or mucilage of gum arabic, will, indeed, dissolve it, and it may that way be made into an emulsion, and it is less acrid in that form than when taken singly. It is often made an ingredient in boluses and electuaries; and enters into two of the officinal compositions; the tinct. bals. Peru. *Lond.* and the troch. glycyrr. comp. *Dubl.*

BA'LSAMUM RACKASIRA, a kind of balsam, which is inodorous when cold, but of a smell approaching to that of Tolu when heated.. It is brought to Europe from India in gourd shells. It is slightly bitter to the taste, and adheres to the teeth when chewed. It is supposed to be one of the factitious balsams, and is scarcely ever prescribed in this country.

BA'LSAMUM SATU'RNI. The remedy so named is prepared by dissolving cerussa acetata in oil of turpentine, and digesting the mixture till it acquires a red colour. This is found to be a good remedy for cleansing foul ulcers; but it is not acknowledged in our Dispensatories.

BA'LSAMUM STYRACIS BENZOINI. See BENZOINUM.

BA'LSAMUM TOLUTA'NUM, BALSAM of TOLU; a substance which is reckoned a true balsam by modern chemists. It is of a reddish, yellow, transparent colour; at first of a thin consistence, afterwards thick and tenacious; and by age it becomes so hard and brittle, that it may be rubbed into powder between the finger and thumb. Its smell is extremely fragrant, somewhat resembling that of the citron. Its taste is warm and sweetish; and when chewed, it adheres to the teeth. Thrown into the fire it immediately liquifies, flames, and disperses an agreeable odour. The tree which affords this balsam, from incisions of its bark, is the *Toluifera balsamum*, Linn. Class, *Decandria.* Order, *Monogynia.* Nat. Ord. *Lomentaceæ.* This tree grows in South America, between Carthagena and Honduras. The Tolu balsam possesses corroborant, stomachic, and stimulant qualities. It has been chiefly used as a pectoral, and is directed in the pharmacopœias in the *syrupus tolutanus*, *tinctura tolutana*, and *syrupus balsamicus.*

BA'LSAMUM TRAUMA'TICUM, VULNERARY BALSAM, a form of medicine prescribed in the London Dispensatory; intended to supply the place of the tincture commonly called the *Friar's balsam*, so famous for curing old ulcers. The London College have named it *tinctura benzoës composita.* See BENZOINUM.

BA'LSAMUM VE'RUM. See BALSAMUM GILEADENSE.

BAMBA'LIO, in the old writers, denotes a man who stammers or lisps.

BAMBOO CANE. The young shoots of this plant, which is the *Arundo bambos* Linn. are prepared by the natives of both Indies, with vinegar, garlic, pepper, &c. into a very excellent pickle, which promotes the appetite and assists digestion. The bamboo contains, in the cavities interposed between its joints, a substance called *tabasheer*, which is a natural secretion, and which, when the plant is dry, is detached from its inner surface. Not only this, but the shining bark on its outside, has lately been found to consist of silex or pure flint.

BA'MIA MOSCHA'TA. See ABELMOSCHUS.

BAMIER, the name of a plant common in Egypt. It produces a pyramidal husk, with several compartments, of the colour of a lemon, and filled with musky seeds. This husk, dressed with meat, is a wholesome food, and has a very agreeable flavour. The Egyptians make great use of it in their ragouts.

BA'N, the Egyptian plant called *Calaf*.

BANA'NA, a species of the MUSA or plantain. The plantain-tree is a genus of the monœcia order, belonging to the polyandria class of plants; and in the natural method ranking under the eighth order, *Scitamineæ*. The most remarkable species are, 1. The PARADISAICA, or plantain; 2. The MUSA SAPIENTUM, or banana tree. Both are amongst the most important productions of the earth.

The first sort is cultivated in all the islands of the West Indies, where the fruit serves the Indians for bread; and some of the white people also prefer it to most other things, especially to the yams and cassada bread. The plant rises with a soft stalk 15 or 20 feet high; the lower part of the stalk is often as large as a man's thigh, diminishing gradually to the top, where the leaves come out on every side; these are often eight feet long, and from two to three feet broad, with a strong fleshy midrib, and a great number of transverse veins running from the midrib to the borders. The leaves are thin and tender, so that where they are exposed to the open air, they are generally torn by the wind; for, as they are large, the wind has great power over them. These leaves come out from the centre of the stalk, and are rolled up at their first appearance; but when they are advanced above the stalk, they expand and turn backward. As these leaves come up rolled in the manner before-mentioned, their advance upward is so quick, that their growth may almost be discerned by the naked eye; and if a fine line is drawn across level with the top of the leaf, in an hour's time the leaf will be near an inch above it. When the plant is grown to its full height, the spike of flowers will appear in the centre, which is often near four feet in length, and nods on one side. The flowers come out in bunches; those in the lower part of the spike being the largest; the others diminish in their size upward. Each of these bunches is covered with a spatha or sheath of a fine purple colour, which drops off when the flowers open. The upper part of the spike is made up of male or barren flowers, which are not succeeded by fruit, but fall off with their covers. The fruit, or plantain, is about a foot long, and an inch and a half or two inches diameter; it is at first green, but when ripe, of a pale yellow colour. The skin is tough, and within is a soft pulp of a luscious sweet flavour. The spikes of fruit are often so large as to weigh upwards of 40lb. The fruit of this sort is generally cut before it is ripe. The green skin is pulled off, and the heart is roasted in a clear fire for a few minutes, and frequently turned: it is then scraped, and served up as bread. Boiled plantains are not so palatable. This tree is cultivated on a very extensive scale in Jamaica; without the fruit of which, Dr. Wright says, the island would scarcely be habitable, as no species of provision could supply their place. Even flour or bread itself would be less agreeable, and less able to support the laborious negro, so as to enable him to do his business or to keep in health. Plantains also fatten horses, cattle, swine, dogs, fowls, and other domestic animals. The leaves being smooth and soft are employed as dressings after blisters. The water from the soft trunk is astringent, and employed by some to check diarrhœas. Every other part of the tree is useful in different parts of rural economy. The leaves are used for napkins and table-cloths, and are food for hogs.

The second sort differs from the first, in having its stalks marked with dark purple stripes and spots. The fruit is shorter, straighter, and rounder: the pulp is softer, and of a more luscious taste. It is never eaten green; but when ripe, it is very agreeable, either eaten raw or fried in slices as fritters; and is relished by all ranks of people in the West Indies.

Both the above plants were carried to the West Indies from the Canary Islands; whither, it is believed, they had been brought from Guinea, where they grow naturally. They are also cultivated in Egypt, and in most other hot countries, where they grow to perfection in about ten months from their first planting to the ripening of their fruit. When their stalks are cut down, there will several suckers come up from the root, which in six or eight months will produce fruit; so that, by cutting down the stalks at different times, there is a constant succession of fruit all the year.

In Europe there are some of these plants preserved in the gardens of curious persons, who have hot-houses capacious enough for their recep-

tion, in many of which they have ripened their fruit very well; but as they grow very tall, and their leaves are large, they require more room in the stove than most people care to allow them. They are propagated by suckers, which come from the roots of those plants which have fruited; and many times the younger plants, when they are stinted in growth, will also put out suckers. Some attempts, however, are now making to introduce it into Britain as an article of general sustenance—the success of these is most devoutly to be wished.

The fruit of the second species is four or five inches long, of the size and shape of a middling cucumber, and of a high, grateful flavour; the leaves are two yards long, and a foot broad in the middle; they join to the top of the body of the tree, and frequently contain in their cavities a great quantity of water, which runs out, upon a small incision being made into the tree, at the junction of the leaves. Bananas grow in great bunches, that weigh a dozen pounds and upwards. The body of the tree is so porous as not to merit the name of wood; the tree is only perennial by its roots, and dies down to the ground every autumn.

When the natives of the West Indies (says Labat) undertake a voyage, they provide themselves a paste of banana; which, in case of need, serves them for nourishment and drink: for this purpose they take ripe bananas; and having squeezed them through a fine sieve, form the solid fruit into small loaves, which are dried in the sun or in hot ashes, after being previously wrapped up in the leaves of Indian flowering-reed. When they would make use of this paste they dissolve it in water, which is very easily done; and the liquor, thereby rendered thick, has an agreeable acid taste imparted to it, which makes it both refreshing and nourishing. The banana is highly nutritious as food, but furnishes no addition to the Materia Medica.

BA'NCIA. See Elaphoboscum.

BANDAGE, in surgery, any application by which mechanical pressure is afforded, for the purpose of keeping a part in a certain intended position. In the most usual acceptation of the term, however, it denotes a band, swathe, roller, or narrow fillet, passed round a part affected, and the parts adjacent, and including compresses, plasters, &c. Of bandages there are two sorts; whereof one sort are remedies of themselves: the other, being intended only to keep topical remedies on the part, are called more particularly *retentive bandages.*

Bandages are a very necessary part of the apparatus of the surgeon. They are of most excellent use in restraining dangerous hæmorrhages, and in assisting the union of fractured or dislocated bones. Almost all bandages have usually been made of linen cloth, softened by wearing, but strong. This may do for the simple purpose of retaining the dressings applied to a wound; but where firm and uniform pressure as a curative means are required, they should be made of fine thin flannel, of a loose texture, or of a coarse, thin, loose-woven cotton or callico. They are to be made of a proper length and breadth for the occasion; and, that they may be strong, we should examine the threads, and tear the cloth lengthways. Darns, seams, and large hems in the cloth, are, as much as possible, to be avoided, that no inconvenience may be brought on by the roughness and irregularity of the roller.

Bandages may be distinguished also into simple and compound; the simple are those which are formed of one entire piece of linen; the compound, of several pieces sewed together, in different manners. The most simple of all bandages is that used in phlebotomy. The next to this, is that called the single-headed bandage, which is rolled up at one end only. Next to that, the double-headed bandage, or that rolled up at both ends. After these come those bandages which are made out of one piece, but are divided at both ends, almost as far as the middle; these are usually called, by surgeons, four-headed bandages. Another sort is somewhat shorter, and narrower than the last described, and is divided at one end, and perforated at the other. This is usually employed in dressing the penis, or the finger, &c. Another kind is, from its use, called the uniting bandage: it is a double-headed bandage, divided about the middle, and serves to unite the wounds that are made lengthways, without requiring the suture. There is also another bandage, provided with an opening in the middle, through which the head may easily pass; the extreme parts of the bandage hanging, one over the breast, the other over the back. The chief use of this bandage consists in this; that in dressing wounds of the thorax or abdomen, it is capable of supporting another bandage, something wider, made of a cloth four or six times doubled, and bound round the breast or belly.

There remains still to be considered, a compound bandage made of two pieces of cloth, almost in form of the letter T. The upper part of this is to be brought round the belly, and fastened by the knot; but the lower part passes under the body, between the thighs, and, being brought up again, is fastened to the upper part upon the back. This bandage plainly appears to be designed for the security of such dressings as shall be applied to the *anus*, or parts of generation. Some, from the inventor, call this Heliodorus's bandage; others, from its shape, denominate it the T bandage; and, from the division that is frequently made at the lower part of it, it is sometimes called the double T.

As to bandages for the head, notwithstanding

surgeons have formerly invented different kinds of them, for every wound that could be inflicted on that part, yet there is but one form that seems necessary; and this alone will answer all the ends that can be proposed from this kind of application. It is requisite only to employ a handkerchief, napkin, or any square piece of linen doubled up in a triangular form; and applying it as we frequently do in hot weather, when we lay aside the usual coverings of the head. In our hospitals, an elastic woollen cap is most used, and in general answers every good purpose.

But there is another method of bandage in use, called creeping bandages, and in the French schools RAMPANTS. These creeping, or, as we sometimes call them, serpentine bandages, are used to secure cataplasms, or compresses, upon a diseased part. Some nicety is requisite as to the place of beginning and ending these bandages. When the arm is to be dressed, the beginning is formed by two or three circular windings on the wrist, ascending by loose spires, up to the cubit or shoulder, as the nature of the case shall require. But, when the beginning is to be on the foot, it is to be formed by three or four circular windings of the bandage, round the tarsus and metatarsus; then proceeding, in a serpentine course, up to the knee; or, if the case requires it, up to the head of the thigh, and then, as it sometimes happens, descending again.

We should not omit to mention, that the beginning of the bandage is sometimes applied to the diseased part, as in several kinds of fractures; sometimes near it, above it, or below it; and sometimes at a great distance from it, according to the disposition of the wound. On the contrary, the extremity of the bandage is scarcely ever fastened on the diseased part, but rather on a sound one, to avoid giving pain. Besides the double and four-headed bandages, surgeons sometimes make use of the eighteen-headed bandage.

In Plate V. we have given a representation of various bandages employed by surgeons, of which the following is an explanation:—Fig. 1. Represents a night-cap, fixed in such a manner as to serve as one of the best bandages for the head. It is scarcely better, however, as we have said, than the common triangular napkin, or *couvre-chef* of the French. Fig. 2. Shews the bandage, as it is usually termed *radiated.* It is commonly employed for compressing the temporal artery; it answers very well for stopping hæmorrhages in any arteries of the head, as may be seen in fig. 3. where a knot or turn is made at the angle of the jaw. Fig. 4. The bandage usually employed for fractures of the lower jaw, as well as for wounds and other injuries of the under lip, chin, and adjacent parts. Fig. 5. A bandage so applied as to support the head. It is formed by a proper application of the common double-headed roller, fig. 7. Fig. 6. A common single-headed roller; a bandage that answers for various purposes. Fig. 7. A common double-headed roller. Fig. 8. A double-headed roller, with a slit in the middle, forming what is termed the *uniting* bandage. Fig. 9. A four-headed roller, mostly employed for fractures of the lower jaw and injuries of the contiguous parts. Fig. 10. A bandage of twelve tails applied to a leg. This is the most useful bandage for fractures, as well as for various other accidents on the extremities. Fig. 11. The uniting bandage, fig. 8, applied to a wound in the upper extremity. Fig. 12. A many-tailed bandage, commonly used in the London hospitals. Fig. 13 and 14. A front and a back view of the napkin and scapulary, the most useful bandage for injuries of almost every part of the thorax and abdomen. Fig. 15 and 16. Different forms of the T-bandage. This bandage proves particularly useful in diseases of the anus and perineum. The hole *a* is intended for admitting the penis. At *b*, that part of the bandage which passes between the legs is divided into two; one part of it passing on one side of the penis and scrotum, and the other on the opposite side.

A bandage is described by Heister, for the head, called *knotted*, from its many crossings on the temples; and *stellar*, or *solar*, from its directions in radii. It is a very useful bandage, when the temporal artery is divided, either in arteriotomy, or by an accidental wound, though not preferable to that represented at fig. 2.

BANDURA; a plant which grows in the thick forests of the island of Ceylon, where its long fibres supply it with water, and where no sun comes to exhale it. Its seeds and seed-vessels are like those of gentian; but it is most remarkable for a foliacious spatha or sheath about a foot long, and as thick as a man's arm; and for its appendages, at the ends of its leaves, which turn up, and contain a cooling limpid liquor, as does its sheath, which is half full, and potable. The root is astringent, and the liquor in the sheath cooling. It grows not far from Columbo, in moist shady woods.

BANGUE, a species of opiate, in great use throughout the east, for its intoxicating qualities. By the Persians it is called *beng;* by the Arabs, *essrar*, corruptly *asseral*, and *assarth;* by the Turks, *bengitic*, and vulgarly called *mastack;* by the European naturalists, *bangue*, or *bange.* It is the leaf of a kind of wild hemp, growing in the countries of the Levant; and differing little, either as to leaf or seed, from our hemp, except in size. Some have mistaken it for a species of althæa.

There are various ways of preparing it, in different countries. Olearius describes the method used in Persia. Mr. Sale tells us, that, among the Arabs, the leaf is made into pills, or conserves. But the most distinct account is that given by

Alexander Maurocordato, counsellor and physician of the Ottoman Porte, in a letter to Wedelius. According to this author, bangue is made of the leaves of wild hemp, dried in the shade, then ground to powder: it is put into a pot wherein butter has been kept; set in an oven till it begin to torrify; then taken out, and pulverized again: thus to be used occasionally, as much at a time as will lie on the point of a knife. Such is the Turkish bangue. The effects of this drug are, to confound the understanding, set the imagination loose, and induce a kind of folly and forgetfulness. Bangue, in reality, is a succedaneum for wine, and obtains in those countries where Mahometanism prohibits the use of that liquor absolutely. Opium and this bangue, are said to be both used by the Turks to prepare themselves for battle. The bangue rouses their courage, and drives them, with eagerness, to certain death. A substance having such powerful effects on the nervous system, one might expect would be capable of useful application in medicine; but authors, who have described it as a luxury, have not adverted to this circumstance, as far as we know.

BANI'LAI. See VANILLA.

BANISTE'RIA, in botany, a genus of the trigynia order, belonging to the decandria class of plants; and in the natural method ranking under the 23d order, *trihilatæ*. The calyx is quinquepartite, with nectareous pores on the outside of the base; the petals are roundish and ungulated; the seeds are three, with membranaceous wings. There are seven species, all natives of warm countries, but possessing no remarkable properties.

BANK'SIA, in botany, a genus of the monogynia order, belonging to the tetrandria class of plants. The amentum is scaly, the corolla consists of four petals; the antheræ are in the cavity of the folds, and sessile; the capsule is bivalvular; and the seed is solitary, and bipartite. There are four species, the serrata, integrifolia, eridæfolia, and dentata, all natives of New Holland.

BANNOCK, a kind of oat-cake, baked in the embers, or on a stone placed before the fire. It is common in the northern parts of this kingdom, especially among the peasantry.

BAO'BAB, or BAHOBAB, the only species of the genus called by Linnæus *adansonia*. This tree is the largest production of the whole vegetable kingdom. The trunk is not above twelve or fifteen feet high, but from sixty-five to seventy-eight feet round. The lowest branches extend almost horizontally; and, as they are about sixty feet in length, their own weight bends their extremities to the ground, and thus they form an hemispherical mass of verdure about one hundred and twenty, or one hundred and thirty feet diameter.

The roots extend as far as the branches. That in the middle forms a privot, which penetrates a great way into the earth; the rest spread near the surface themselves. The flowers are in proportion to the size of the tree; and are followed by an oblong fruit pointed at both ends, about ten inches long, five or six broad, covered with a kind of greenish down, under which is a ligneous rind, hard, and almost black, marked with rays which divide it lengthways into sides. This fruit hangs to the tree by a pedicle two feet long and an inch diameter. It contains a whitish spongy, juicy, substance, of an acid taste, and seeds of a brown colour, and the shape of a kidney-bean, which are called *goui*. The pulp that surrounds these seeds is powdered when dry, and brought into Europe from the Levant, under the name of *terra sigillata Lemnia*. It grows mostly on the west coast of Africa, from the Niger to the kingdom of Benin.

The bark of this tree is called *lalo*: the negroes dry it in the shade, then powder and keep it in little cotton bags, and put two or three pinches into their food. It is mucilaginous, and powerfully promotes perspiration. The mucilage obtained from this bark is a powerful remedy against the epidemic fevers of the country that produces these trees; so is a decoction of the dried leaves. The fresh fruit is as useful as the leaves for the same purposes.

BAPTISE'CULA, in botany, a name given by some authors to the blue corn-flower, called the *cyanus*, or blue-bottle.

BA'PTES, a name given by the ancients to a fossile substance used in medicine; but they have left us very insufficient descriptions of it. Pliny only tells us, that it was soft, and of an agreeable smell. Hence Agricola judges, that it was probably one of the bitumens.

BARA-PICKLET, bread made of fine flour kneaded with barm, which makes it very light and spongy; *bara* being the Welsh for bread. In the north of England, it is formed into flat cakes, which are called picklets.

BARBA, in botany, a light species of down, covering the surface of some plants. See PUBES. The term *barba* was invented by Linnæus, and was made use of in his *Delineatio Plantæ*, without any explanation. Its meaning, therefore, has not been well ascertained; but, by its application in the *species plantarum*, it seems to signify a tuft or bunch of strong hairs terminating the leaves, as in the *mesembryanthemum barbatum*.

Barba Corollæ Ringentis, denotes the lower lip of a ringent, or gaping corolla. See COROLLA. This term was invented by Rivinus, and stands opposed to galea ringentis, which denotes the upper-lip. See GALEA.

BA'RBA CA'PRIÆ. See ULMARIÆ.

BA'RBA HI'RCI. See TRAGOPOGON.

BA'RBA JO'VIS. See SEDUM MAJUS.

BA'RBADOES' CHERRY; the fruit of the malphigia glabea Linn. They are of a red colour,

of the size of small cherries, and are gathered and eaten by the inhabitants of the West India islands, particularly Barbadoes. In moderate quantity they are considered as wholesome, though very inferior to cherries.

BARBADOES' NUT. See RICINUS MAJOR.

BARBADOES' TAR. See PETROLEUM BARBADENSE.

BARBARÆA. The leaves of this plant, *erisymum barbaræa, foliis lyratis, extimo subrotundo,* Linn. may be ranked amongst the antiscorbutics. They are seldom used in practice notwithstanding.

BARBAROSSA'S PILL, an ancient composition of quicksilver, rhubarb, diagridium, musk, amber, &c. It was the first internal mercurial medicine which obtained any real credit.

BARBA'TUS FLOS, (from *barba,* a beard); a bearded, gaping, or ringent flower. This term, as it is used by Rivinus, is synonimous to the ringens of Linnæus, and to the labiatus and personatus of Tournefort. See COROLLA and LABIATUS. The ringent, or gaping flowers, form the class didynamia of the sexual system. See DIDYNAMIA.

BARBER-SURGEON, a description of twofold operator, formerly existing in Britain, and even now on the continent. With us this preposterous union was dissolved by a statute of Henry VIII. by whom the surgeons were formed into a distinct corporation, which existed till the late establishment of the royal college of surgeons of London. See COLLEGE OF SURGEONS.

Anciently, in England, a lute or viol, or some such musical instrument, was part of the furniture of a barber's shop, which was used then to be frequented by persons above the ordinary level of the people, who resorted to the barber either for the cure of wounds, or to undergo some chirurgical operations, or, as it was then called, to be *trimmed:* a word that signified either shaving or cutting and curling the hair. These, together with letting blood, were the ancient occupations of the barber-surgeon. As to the other important branch of surgery, the setting of fractured limbs, that was practised by another class of men called *bone-setters,* of whom there are hardly any now remaining. The musical instruments in his shop were for the entertainment of waiting customers; and answered the end of a newspaper, with which, at this day, those who wait for their turn at the barber's amuse themselves. Phlebotomy and tooth-drawing are even now not very unusually practised by country barbers; and, not unfrequently, to the detriment of the inconsiderate patient.

BA'RBERRY. See BERBERIS.

BA'RBULÆ, in botany, a name given by Pliny to the semi-flosculi.

BARBY'LA, in botany, a name by which Theocritus, and other of the early writers, have called the common damask prune.

BARDA'NA, (from *bardus,* foolish; because silly people are apt to throw them on the garments of passengers, having the property of sticking to whatever they touch); *l'happa major;* BURDOCK; the *arctium lappæ* Linn. *arctium foliis cordatis inermibus petiolatis.* Class, *Syngenesia.* Order, *Polygamia æqualis.* This plant grows wild in uncultivated places. The seeds have a bitterish subacrid taste: they are recommended as very efficacious diuretics, given either in the form of emulsion, or in powder, to the quantity of a drachm. The roots taste sweetish, with a light austerity and bitterishness: they are esteemed aperient, diuretic, and sudorific; and are said to act without irritation, so as to be safely ventured upon in acute disorders. Decoctions of them have of late been used in rheumatic, gouty, venereal, and other disorders; and are preferred by some to those of sarsaparilla.

BAREGE-WATER: this is classed, by writers on the subject, among the hot sulphureous waters; and is recommended against several cutaneous diseases.

BARI'LLA, known also by the names of *carbonas sodæ alcalescens impurus; sal alkalinus fixus fossilis; natron; soda; anatron; aphronitrum; baurach,* &c. The natron, mineral alkali, or mineral fixed alkaline salt, of the pharmacopœias. The plant from which this impure mineral alkali is principally procured, is the *salsoli kali* Linn. *salsola herbacea decumbens, foliis subulatis spinosis scabris, calycibus marginatis axillaribus.*—Class, *Pentandria.* Order, *Digynia.* It is cultivated on the coast of the Mediterranean. Barilla may be obtained in Britain from a variety of plants, but principally from the *salsola kali, salicornia erropæa, zostera maritima, triglochin maritimum, chenopodium maritimum, atriplex portulacoides,* and *littoralis, plantago maritima, tamarix gallica, eryngium maritimum, sedum telephum, dipsacus fullonum,* &c. When good, it is firm, hard, heavy, porous, dry, and sounds on percussion: it is of a bluish colour, and imparts a flavour at first slightly resembling that of a violet. The plants, about the time the seeds become ripe, are pulled up by the roots, and exposed in a suitable dry place, where they are tied up in bundles, and burned in an oven constructed for the purpose, where the ashes are continually stirred while hot. The saline matter falls to the bottom, and, on becoming cold, forms a hard mass, which is afterwards broken into pieces of convenient size for exportation.

BARK, the exterior part of a tree, corresponding to the skin of an animal. As animals are furnished with a panniculus adiposus, usually replete with fat, which invests and covers all the fleshy parts, and protects them from external injury; plants are encompassed with a bark, by means whereof the cold is kept out, and in winter-time the spiculæ of ice prevented from fixing and freezing

the juices in the vessels; whence it is that some sorts of trees remain ever-green the year round. The bark of trees in general is of a spongy texture; and, by many little fibres which pass through the capillary tubes, whereof the wood consists, it communicates with the pith; so that the proper nutriment of the tree, being imbibed by the roots, and carried up through the vessels of the tree by the warmth of the soil, &c. to the top of the plant, is usually supposed to be there condensed, and in that form returns by its own gravity down the vessels, which do the office of veins, lying between the wood and inner bark; leaving, as it passes by, such parts of its juice as the texture of the bark requires for its support. That soft whitish rind or substance between the inner bark and the wood, which Mr. Bradley thinks does the office of veins, some account a third bark, only differing from the other two in that its fibres are closer. It is this contains the liquid sap, gums, &c. found in plants in the spring and summer months. It hardens by little and little, by means of the sap it transmits, and is converted imperceptibly into the woody part of the tree. There are few trees without it; yet it is still found in less quantity as the tree is more exposed to the sun: that of the oak is ordinarily about an inch thick. It is here that the decay of trees generally begins; whence those who fell and cut out trees, generally take care to leave as little of it on as possible.

The *bark of roots* is sometimes yellow, as in dock; sometimes red, as in bistort; but oftenest white. It is derived from the seed itself, being only the extension of the *parenchyma* of the radicle. It is of various degrees of substance, being sometimes very thin, as in the Jerusalem artichoke, and in most trees: yet sometimes it is very thick, and makes the greater part of the substance of the root, as in asparagus and dandelion. In beet-root, the bark scarce exceeds a good thick skin; whereas, in a carrot, it is half the semi-diameter of the root, being in some places above an inch over. This too is found common to the generality of roots, that their barks are proportionably thicker at bottom than at top.

The inner part of the bark, we have observed, annually lignifies, or turns to wood. The bark of a tree is found each year to divide and distribute itself two contrary ways: the outer part gives towards the skin, till it becomes skin itself, and at length falls off, like the human cuticle, or the exuviæ of serpents; while the inmost portion is yearly distributed and added to the wood.

The bark is found truly continuous to the body of a tree, as the skin of our body is to the flesh; contrary to the common opinion, that the bark only surrounds the tree, as a scabbard does a sword, or a glove the hand; which seems confirmed by the easy slipping of the bark of willow, and most other trees, when full of sap, from the wood. Their continuity is effected by means of the *parenchyma*, which is one entire body, running from the bark into the wood, and thus uniting both together. The reason why the bark slips so easily from the wood is, that most of the parenchymous parts are young vessels, formed every year successively between the wood and the bark, and are much in the condition of the tender vessels or fibres of the embryo in a womb, or egg; a thousand of which are broken with the smallest force. That trees only live by the ascent of the sap in or between the bark and the wood, and that if a circle be drawn round any tree (except, perhaps, ash), by incision to the timber, how thin soever the knife be, provided no part of the thickness of the bark remain uncut, the tree will die from that part upwards, has been the standing doctrine of naturalists of all ages, and is delivered for fact by Pliny and others. Dr. Plott asserts this to be a popular error, from the instance of a large old elm in Magdalen-college grove, quite disbarked around, at most places two feet, at some four feet, from the ground, which yet grew and flourished many years, as well as any tree in the grove. Besides, it was entirely without pith, being hollow within as a drum; and the same is confirmed from the history of the elm in the Thuilleries, related by M. Parent, which lived and put out leaves, though entirely stripped of bark from top to bottom. Add to this, that the plane and cork trees divest themselves yearly of all their old bark, and acquire new, as snakes do their skins; and, in the change from one to the other, it is evidently not by the bark that they are nourished. Some infer from hence, that the bark never feeds the wood; but Dr. Plott is more reserved in his conclusion, arguing only, that hence it seems to follow, that there must be other vessels, besides the sap-vessels of the bark, capable of the office of conveying sap. It is probable, when the ordinary conveyance fails, some of the woody part, which had all once been sap-vessels, resumes its ancient office; or, as the author last mentioned conjectures, they still so far retain their office of conveying sap, as to keep a tree alive, though not to augment it; which may, perhaps, be one different use of those sap-vessels in the wood from those in the bark, the former being sufficient for the continuation of a tree, and the latter serving only for its augmentation.

Mr. Brotherton however has related some experiments, which seem to decide the controversy by shewing that the *bark* is not the vehicle of vegetation. He hacked a crab-tree all round with a hatchet, so as, besides cutting off the *bark*, to cut pretty deep into the wood, for the breadth of about four inches; yet the same year it was observed to increase very considerably in thickness above the divided part, and to shoot in length of wood about one foot. The next year it also grew considerably, and shot in length five inches; but on the third year it died to the very root. The same happened

to another tree, part of whose *bark* was eaten off by the canker: the lower part stood without increase, and by degrees the wood rotted: the upper part increased to the third year, and then died also. The same writer found, that, in the branches of Scotch fir, the joints above the rings *barked* would grow much larger in three years, than in five if the rings were not cut off. A ring of *bark* three inches broad being cut off a Scotch fir, near the bottom of the stem, below the uppermost knot or joint, was found to grow and shoot out at its top half a yard, and all the parts above the ring to increase in thickness the same year, much more than they would have done, had not the section been made; but all the part of the stem between the ring and the next knot below it did not grow at all: the part below the ring next under that, increased in some degree, though less than it would have done, if the bark had not been cut off. The second year the increase was also considerable; but on the third year it died.

M. Magnol mentions an olive-tree, from which a circular ring of bark being cut away, the tree that year bore, above the place of incision, double the quantity of flowers and fruit which it used to bear. Mr. Reneaume relates a fact nearly similar to this. In the country about Aix and Marseilles, when an olive-tree grows old, and almost ready for felling, they have a method of making it first yield all the fruit which it is capable of producing, by cutting a circular ring of bark, an inch broad, from one of its young branches, and in its place putting an equal ring of bark taken from the branch of a young bearing olive-tree. The effect of this engraftment is, that the branches of the old tree bear plentifully the ensuing year, and those of the young one die away.

Upon the whole, Mr. Brotherton concludes, that most of the sap, if not all, ascends in the vessels of the woody part, and not by the bark, nor between the bark and the wood. Mr. Lewenhoeck, on the other hand, has given several experiments and observations with the microscope, to shew that the bark of trees is produced from the wood, and not the wood from the bark. Be this as it may, it is very remarkable, that trees stripped in the time of the sap, and suffered to die, afford timber heavier, more uniformly dense, stronger, and fitter for service, than if the tree had been cut down in its healthy state. Something of a like nature has been observed in the writings of Vitruvius and Evelyn. Mem. Acad. Scienc. 1738.

Many of the peculiar secretions of the tree are found in the bark, such as essential oil, resin, gum, and gummous resin. The bark has its peculiar diseases, yet wounds of it never prove fatal to the tree. Flax and hemp are the sap-vessels, or ligneous fibres, of the bark of the plants which produce them.

There are a great many kinds of barks used in Medicine, as the *Cinchona*, or *Jesuit's Bark*, *macer*, *cascarilla*, *&c.* See Cinchona, &c.

BARK; a term very frequently employed, by way of eminence, to signify the Peruvian bark, of which, besides the common kind, there is the red and yellow. See Cinchona.

BARLE'RIA, a genus in Linnæus's botany. He enumerates ten species.

BARLEY. See Hordeum

BARLEY, CAUSTIC. See Cavadilla.

BARLEY, PEARL. See Hordeum perlatum.

BARM, another name for yeast. See Yeast.

BARNET WATER, a saline purgative spring, much weaker than the mineral waters of Epsom.

BAROMETER, (from βαρος, *a weight*, and μετρον, *a measure*); an instrument for determining what the weight of the air is, or, for observing the changes in the air. It is frequently called the *Torricellian Tube*, from Torricelli, its inventor. See Atmosphere.

BARONES, small worms, called also *nepones*.

BA'ROS, (βαρος, gravity). Hippocrates uses this word to express by it an uneasy weight in any part.

BAROS, an Indian name for that species of camphor which is distilled from the roots of the true cinnamon-tree.

BARRELIERI, American red oxalis, a species of Oxalis. The same name is given to the Spanish rocket, a species of Sisymbrium.

BARRENNESS, the same with sterility; the quality of a thing that is barren; in opposition to fecundity. Women frequently become sterile after a miscarriage, or a difficult labour, in consequence of injuries done to the uterus, or some other of the genital parts. Van Swieten says, he has seen the vagina uteri schirrous throughout, and so much swelled in every point as to be scarcely able to admit a probe. It is also frequently observed in women who have lived sterile, that the uterus becomes cancerous about the time when their menses leave them. From all this it is sufficiently evident, that a schirrus is deservedly reckoned among other organical defects which cause sterility.

BARRINGTO'NIA, in botany; a genus of the polyandria order, belonging to the monadelphia class of plants, the characters of which are: one female, the calyx dyphyllous above; with a drupa, which it crowns; and the seed is a quadrilocular nut. There is but one species known, the speciosa, a native of China and Otaheite.

BARTHOLINE'S GLANDS. See Sublingual glands.

BARTSIA, a genus in Linnæus's botany. He enumerates five species.

BARY'TES, (from βαρυς, *heavy*), an earth generally known by the name of terra ponderosa, or ponderous earth. It is to the celebrated che-

mists Gahn, Scheele, and Bergmann, that we are principally indebted for our knowledge of this earthy substance. It has not yet been found free from all combination; but in order to obtain it in a suitable degree of purity, the following process may be employed: the sulphate of barytes, or ponderous spar, which is the most usual combination met with in the earth, is to be pulverized, and calcined in a crucible, with an eighth part of powder of charcoal: the crucible must be kept ignited during an hour; after which the calcined matter is to be thrown into water: it communicates a yellow colour to this fluid, at the same time that a strong smell of hepatic gas is emitted; the water is then to be filtered, and muriatic acid poured in: a considerable precipitate falls down, which must be separated from the fluid by filtration. The water which passes through the filter holds the muriate of barytes, or marine salt of ponderous earth, in solution. A solution of the carbonate of pot-ash, or mild vegetable alkali, being then added, the ponderous earth falls down, in combination with the carbonic acid; and this last principle may be driven off by calcination. Pure barytes is of a pulverulent form, and extremely white. It is soluble in about nine hundred times its weight of distilled water, at the temperature of sixty degrees, according to Mr. Kirwan. The prussiate of pot-ash, or Prussian alkali, precipitates it from its combination with the nitric and muriatic acids, which habitude distinguishes it from other earths. It also precipitates alkalis from their combinations with acids. Mr. Lavoisier having exposed barytes to a flame fed with oxigenous gas, found it to be fused in a few seconds: at first it extended itself upon the surface of the coal; after which it began to burn and detonate until the whole was nearly dissipated. This kind of inflammation is a character common to metallic substances; but when the barytes is pure it is perfectly infusible. When fused in the fire with the silex or alumine of the crucible, it assumes a blue or green colour. This earth urged by the blow pipe makes little effervescence with soda, but is perceptibly diminished: it dissolves in the borate of soda with effervescence, and still more with the phosphates of urine. It has a strong affinity for acids, and serves to detect the presence of the sulphuric acid. Its specific gravity, according to Mr. Kirwan, exceeds 4,000. The combinations of barytes which chemistry has detected are the following:

1. *Sulphur of Barytes.*—This substance, which is the most common of the barytic compounds, is generally called *Ponderous Spar.* It is extremely heavy. Its specific gravity is commonly from 4 to 4.6. It decrepitates in the fire, melts before the blow-pipe without addition, and fluxes dissolve it with effervescence. Mr. Darcet has succeeded in fusing it in a porcelain furnace. This spar has been often confounded with gypsum and fluor spar; but the characters of these two substances are very different. It almost always accompanies metallic ores, and it is even considered as an happy presage of finding them. The analogy between this stone and metals has been established by the experiments of Bergmann and Lavoisier. This stone, when rather strongly heated, exhibits a blueish light in the dark, and forms what has been called the *Bolognian Phosphorus.* To form these kinds of phosphori, the spar is pulverized, the powder is kneaded up with mucilage of gum tragacanth, and the paste is formed into pieces as thin as the blade of a knife. The pieces are afterwards dried, and and strongly calcined by placing them in the midst of the coals of a furnace; they are afterwards cleared by blowing on them with the bellows. In this state, if they be exposed to the light for a few minutes, and afterwards carried into a dark place, they shine like glowing coals. These pieces shine even under water; but they gradually become deprived of this property, which however may be restored again by a second heating. Ponderous spar is easily divided into plates by the slightest blow; and the most usual form which it affects is that of an hexahedral prism, very flat, and terminated by a dihedral summit.

It has been found at the distance of one league from Clermont d'Auvergne, in France, in the form of hexahedral prisms terminated by a tetrahedral or dihedral pyramid. Mr. Chaptal has seen it in crystals of two inches in diameter. It frequently happens that the form of these crystals is not very determinate; but all the stoney substances of the nature of these exhibit a confused assemblage of several plates applied one upon another, and capable of being separated by a very slight blow. Ponderous spar is insoluble in water; and upon this property is founded the virtue possessed by the muriate of barytes, to manifest the slightest portions of sulphuric acid in any combination which contains it. Barytes adheres more strongly to acids than the alkalis themselves do; and when the carbonates of alkalis precipitate it, the effect takes place in the way of double affinity, or attraction.

2. *Carbonate of Barytes.*—This combination of the carbonic acid with barytes has the specific gravity of 3.773. One hundred parts contain twenty-eight of water, seven of acid, and sixty-five of pure earth. The sulphuric, nitric, and other acids attack it with effervescence. Although the carbonic acid possesses the strongest affinity with this earth, it is not very frequently found in combination with it. This substance has been lately found in great plenty in the lead mines at Anglezark near Chorley in Lancashire, and also at Strontian and Dunglass, near Dumbarton, in Scotland.

3. *Nitrate of Barytes.*—The nitric acid dissolves pure barytes, and forms a salt which crys-

tallizes sometimes in large hexagonal crystals, and frequently in small irregular crystals. This nitrate is decomposed by fire, and affords oxigene. The pure alkalis do not disengage the barytes, but the alkaline carbonates precipitate it by double affinity. Both the sulphuric and fluoric acids take this earth from the nitric acid. The nitrate of barytes has not yet been found in a native state.

4. *Muriate of Barytes*—a salt which is capable of assuming a form considerably resembling that of spar, in tables or plates. It exhibits, with the earths, acids, and alkali, phenomena nearly similar to those of the nitrate of barytes. It forms one of the most interesing re-agents to ascertain the existence of the smallest particle of sulphuric salt in any water; because, by the sudden exchange of principles, the result is ponderous spar, which immediately falls down. This substance has not yet been found in a native state.

The medical uses of barytes are confined to its combination with the muriatic acid. It was, a few years ago, introduced into practice by the late Dr. Adair Crawford, who tried it very extensively in St. Thomas's Hospital, in London, and found it, as he expressed himself, " peculiarly calculated to correct the scrofulous diathesis."

With a view to its exhibition for the cure of diseases, Mr Juch proposes the following new method of preparing the muriated barytes, which seems worthy of attention.

" Take one part of finely pulverized barytes or heavy spar. After having burned it, and quenched it in water, add two parts and a half of pot-ash. This mixture is melted, and kept on the fire for an hour and a half, in an earthen vessel, of which those fabricated in Hessi are particularly famous among the German chemists. When the whole mass is entirely fluid, pour it into a clean iron kettle, and boil it well with common water for the sake of clearing it from the sulphate of pot-ash or vitriolated tartar. The barytes obtained in this manner is still mixed with some undissolved spar. Saturate it now perfectly with muriatic acid, and let it evaporate. The remaining dry mass must be melted again in an earthen vessel; and being in a quiet state of fluidity, pour it upon a stone plate; and cover it with a vessel, to prevent any thing escaping, which sometimes happens in cooling. To give this mass a fine, regular crystalization, and to separate it from other heterogeneous matters, it must be dissolved in a sufficient quantity of distilled boiling water. It is not advisable to pulverize it before, because a greater part remains undissolved, when pulverized, than when the whole is put into the vessel. Into this solution, volatile liver of sulphur, dissolved in water, is dropped as long as any precipitation is visible; by which means it is cleared from any adherent metallic particles. The fluid is now filtered, and gently evaporated to the point of crystallization."

Great nicety is certainly required in the preparation of this medicine, and its exhibition must be regulated with the utmost caution. Four or five drops, in distilled water, twice a day, is a sufficient dose in the beginning; but it may, in some cases, be gradually increased to fifteen drops or more. Should any nausea however, or vertigo, be occasioned, this quantity cannot be safely augmented. Dr. Crawford's account of this remedy, may be seen in Vol. II. of Medical Communications, by a society of Medical Gentlemen in London.

BASAAL, an Indian tree growing about Cochin. A decoction of its leaves, with ginger, in water, is used as a gargle in disorders of the fauces. The kernels of the fruit are said to kill worms in the intestines.

BASA'LTES, (from *basal*, iron, or *βασανιζω diligenter examino)*, a heavy and hard kind of stone, chiefly black or green, consisting of prismatic crystals, the number of whose sides is uncertain. The English miners call it COCKLE; the German SCHOERL. Its specific gravity is to that of water as 3000 or upwards to 1000. It frequently contains iron; and consists either of particles of an indeterminate figure, or of a sparry, striated, or fibrous texture. It has a flinty hardness, is insoluble by acids, and is fusible by fire. The following is an analysis of some basaltes by Bergman: Basaltes, 100 parts, contains Siliceous earth 50; Argillaceous 15; Calcareous 8; Magnesia 2; Iron 25.

The most remarkable property of this substance is its figure, being never found in strata, like other marbles, but always standing up in the form of regular angular columns, composed of a number of joints, one placed upon, and nicely fitted to another, as if formed by the hands of a skilful architect.

This substance was originally found in columns in Ethiopia, and fragments of it in the river Tmolus, and some other places. We now have it frequently, both in columns and small pieces, in Spain, Russia, Poland, near Dresden, and in Silesia; but the noblest store in the world seems to be that called the Giant's Causeway in Ireland, and Staffa one of the western isles of Scotland. Great quantities of basaltes are likewise found in the neighbourhood of Mount Ætna in Sicily, of Hecla in Iceland, and of the volcano in the island of Bourbon. These are the only three active volcanoes in whose neighbourhood it is to be met with; but it is also found in the extinguished volcanoes in Italy, though not in the neighbourhood of Mount Vesuvius.

BASE'LLA, Malabar nightshade, a genus in Linnæus's botany. Class, *Pendtndria*. Order, *Trigynia*. Nat. Ord. *Holoraceæ*. He enumerates three species.

BASES, ACIDIFIABLE. See ACIDS, and also the article BASIS.

BASIL. See BASILICUM.

BASILA'RE OS, *(basilaris;* from βασιλευς, a king). Several bones were so termed by the ancients, as the sphœnoid and occipital bones.

BASILA'RIS ARTE'RIA, a branch of the vertebral artery, upon the *apophysis basilaris* of the *os occipitis.* It runs forward under the great transverse protuberance of the *medulla oblongata,* to which it gives branches as well as to the neighbouring parts of the *medulla.* Sometimes it divides into two branches from about the *apophysis basilaris,* which communicate with the posterior branches of the two internal carotids, and are lost in the posterior lobe of the brain.

BASILA'RIS APO'PHYSIS, the great *apophysis* of the *os occipitis.*

BASILA'RIS PROCE'SSUS, the *basilaris,* or *cuneiform* process. See OCCIPITAL BONE.

BASI'LICA NUX, a name given to the walnut.

BASI'LICA VENA (βασιλικη, from βασιλεω, *to govern);* the middle vein of the arm, by way of pre-eminence, is thus called. Sometimes it has a double origin, by a branch of the communication with the trunk of the *axillaris.* It continues its course along the middle of the *os humeri,* between the muscles and integuments; and, having reached the inner condyle, and sent off obliquely in the fold of the arm, the *mediana basilica,* it runs along the *ulna,* between the integuments and the muscles, a little towards the outside, by the name of *cubitalis externa;* and, a little below it, sends off another branch which runs along the inside of the fore-arm near the *ulna:* this branch may be called *cubitalis interna.*

The ancients termed the *basilic vein* of the right arm, the *vein* of the liver, *vena hepatica brachii;* and that of the left arm, the *vein* of the spleen, *vena splenica brachii.*

BASI'LICUM, BASIL. The plant which bears this name in the pharmacopœias, is the *ocimum basilicum; foliis ovatis, glabris; calycibus ciliatis,* Linn. It is supposed to possess nervine qualities, but is seldom employed but as a condiment to season meat, to which it imparts a grateful taste.

BASI'LICUM, or BASILICON, an ointment popularly so named from its having the *ocymum basilicum* in its composition. It came afterwards to be composed of wax, resin, &c. and is now named *unguentum resinæ flavæ.* See RESINA.

BA'SIO-CERA'TO-CHO'NDRO-GLO'SSUS. See HYO-GLOSSUS.

BA'SIO-GLO'SSUM. See HYO-GLOSSUS.

BA'SIO-PHARYNGE'US. See CONSTRICTOR PHARYNGIS MEDIUS.

BA'SIS, (βασις, from βαινω, *to go);* the support of any thing, or that upon which it stands or goes. In *anatomy,* it expresses the upper and broad part of the heart, opposite to the *apex* or point; because, considering it as a cone, which it resembles in shape, this name is proper to it, although by its natural situation it is uppermost. The foundation of the *os hyoides,* has likewise this name; and, it is also used sometimes to signify, in a figurative sense, the chief ingredient of a composition.

BA'SIS, or BASE, in chemistry. Any body which is dissolved by another body, which it receives and fixes, and with which it forms a compound, may be called the *basis* of that compound. Thus, for example, the bases of what have been popularly called *neutral* salts are the alkaline, earthy, and metallic matters which are saturated by the several acids. In this sense it is that these neutral salts are called *salts with earthy bases, salts with alkaline bases, salts with metallic bases:* also the appellations *basis of alum, basis of nitre, basis of Glauber's salt, basis of vitriol, &c.* signify the argillaceous earth, which, with the vitriolic acid, forms alum; the vegetable alkali, which, with the nitrous acid, forms nitre; the mineral alkali, which, with the vitriolic acid, forms Glauber's salt; and the metal which, with the vitriolic acid, forms a vitriol; because these substances are supposed to be fixed, inactive, and only yielding to the action of the acids which they fix, and to which they give a body and consistence.

The chemical philosophers have for a long time been in the habit of considering the acids as bodies possessing an activity peculiar to themselves, and have, in general, overlooked the circumstance, that an equal activity, or power of attraction, must exist in those substances with which they combine, and are by that means deprived of their distinctive properties. The substances with which acids enter into combination, and are said to be neutralized, are, for the most part, less volatile than the acids themselves; and accordingly communicate a degree of fixity to those acids. From both these reasons, writers have been led to distinguish the substance which is united with any acid, by the name of the basis of the compound, or neutral salt. As a considerable advantage, with regard to chemical language, is obtained from the use of this term, which is not altogether improper, it is still much used by chemical authors. Thus, we say, salts with earthy bases, salts with alkaline bases, or salts with metallic bases, accordingly as the case may be; by which it is to be understood that these substances are united with an acid. And so, likewise, the expressions, vitriolic salt with basis of clay, nitrous salt with basis of vegetable alkali, marine salt with basis of iron, and other similar expressions, are used to advantage by chemical writers, who wish to describe combinations, and at the same time to avoid the usual names which in many instances refer to theories either exploded or doubtful.

BATA'TAS. So the natives of Peru call the potatoe, (which is a native of that country), from

whence our word potatoe. It is a species of nightshade, viz. the *solanum tuberosum*, Linn. They were first brought into Europe by Sir Francis Drake in 1486, and planted in London. They are said to be natives of Peru.

BATH, *(balneum);* a convenient receptacle of water for persons to wash or plunge in, either for health or pleasure. Baths are distinguished into *hot* and *cold;* and these again are either natural or artificial. See BATHS and BATHING. The natural hot baths are formed of the water of hot springs, of which there are many in different parts of the world; especially in those countries where there are, or have evidently been, volcanoes. The artificial hot baths consist either of water or of some other fluid made hot by art. The cold bath consists of water, either fresh or salt, in its natural degree of heat; or it may be made colder by art, as by a mixture of nitre, sal-ammoniac, &c. The chief hot baths in our country are those of Bath and Bristol, in Somersetshire, (see BATH WATERS); and those also of Buxton and Matlock, in Derbyshire; which latter, however, are rather warm or tepid, than hot. The use of these baths is found to be beneficial in diseases of the head, as palsies, &c. in cuticular diseases, as leprosies, &c. obstructions and constipations of the bowels, the scurvy and stone, and in many diseases of women and children. The baths have performed many cures, and are commonly used as a last remedy in obstinate chronic diseases; in which they succeed well, if they happen to agree with the constitution of the patient: but whether they will agree or not, cannot be known but by making the experiment.

With regard to the origin of those hot waters, of which the natural hot baths are formed, we are very much in the dark. All that can be affirmed with certainty is, that, where there are volcanoes, there also are hot springs in very great abundance; but how the heat of the volcano should be constantly communicated to the waters of a spring for many ages, during a great part of which the volcano itself has lain in a dormant state, seems almost beyond the reach of investigation. Another thing that creates a great difficulty is, that the fire of a volcano must certainly lie very deep in the earth, and most probably shifts from place to place; but the waters of a spring must always issue from a place situated lower than the origin of the spring itself. Besides, though we should suppose the water to come from the top of a volcano itself, and consequently boiling hot, it could not be supposed to percolate far through cold earth, without losing all the heat it acquired from the volcano. From some observations, however, it certainly does appear, that there are some spots on the earth which have a power of producing heat within themselves, independent of any thing foreign; and that water is so far from being able to destroy this power, that it seems rather to promote and continue it. We know that water has this effect upon a mixture of iron filings and sulphur; but whatever quantities of similar substances we may suppose to be contained in the earth, we must also suppose to be destroyed by one great conflagration soon after they have begun to act upon each other, so that by their means no lasting heat in waters could be produced. Dr. Stukely indeed would solve this, and several other phenomena, by making the fire and smoke of volcanoes the effects of electricity: but here sufficient proof is wanting; for electricity, even in its most powerful state, is not very apt to set bodies on fire. The thought, however, deserves attention; for, if electricity is capable of setting a volcano on fire, it is undoubtedly capable of producing solfaterras where it meets with proper materials, and from them springs of any degree of heat.

The cold bath, though popularly esteemed one of the most innocent remedies yet discovered, is not however to be adopted indiscriminately. On the contrary, it is liable to do considerable mischief in *all* cases of *diseased viscera*, and is not in any case proper to be used during the existence of costiveness. As a preventive remedy for the young, and as a general bracer for persons of a relaxed fibre, especially of the female sex, it often proves highly advantageous; and in general the popular idea is a correct one, that the *glow* which succeeds the use of the cold or temperate baths is a test of their utility; while, on the other hand, their producing *chillness*, head-ach, &c. is a proof of their being pernicious.

BATH, CHEMICAL. Several matters employed, in chemical operations, to transmit heat, are called baths; but the substances most frequently used for this purpose, are water and sand. When water is employed, it is called *balneum mariæ*, or *water-bath;* which is frequently used, very convenient for many operations, and may be employed successfully for all degrees of heat inferior to that of boiling water. As water, when exposed to fire in any vessel from which it can evaporate, does only receive a determinate degree of heat, which always remains the same when once it has arrived to the boiling heat, it follows, that, by the water-bath, a degree of heat always equal may be transmitted with certainty. Farther, this degree of heat being incapable of burning, or of communicating an empyreumatic quality to matters susceptible of it, the water-bath has also the advantage of not exposing substances to this inconvenience. When vessels in which distillations and digestions are made, are placed in sand, then is formed what is termed *balneum arenæ*, or a *sand-bath.* This intermediate substance of sand is very convenient to moderate the too great activity of the naked fire, and to transmit any degree of heat from the weakest to a red heat. As this bath is attended with less trou-

ble, and requires a less considerable apparatus than the water-bath, it is much used in laboratories. Nothing is requisite for the sand-bath, but an earthen or iron pot filled with fine sand, which is fitted into a furnace, and capable of containing the retorts, or other vessels, containing the matter to be operated upon.

BATH-WATERS; the waters afforded by a mineral spring at Bath, in Somersetshire. They are celebrated on account of their having a higher temperature than any other in Britain, and being the only springs which are sensibly hot to the touch. All other *thermal* waters of this island are below the animal temperature, and deserve that appellation, only from being invariably warmer than common springs are in general.

By the erection of elegant baths, these waters are particularly adapted to the benefit of invalids, who find here a variety of establishments, contributing equally to health, convenience, and amusement. There are three principal springs in the city of Bath, namely, those called the King's Bath, the Cross Bath, and the Hot Bath; all within a short distance of each other, and emptying themselves into the river Avon, after having passed through the several baths. Their supply is so copious, that all the large reservoirs used for bathing, are filled every evening with fresh water, from their respective fountains. In their sensible and medicinal properties, there is but a slight difference: according to Dr. Falconer, the former are,

1. That the water, when newly drawn, appears clear and colourless, remains perfectly inactive, without bubbles, or any sign of briskness or effervescence.

2. After being exposed to the open air for some hours, it becomes rather turbid, by the separation of a pale yellow, ochery, precipitate, which gradually subsides.

3. No odour is perceptible from a glass of the fresh water, but a slight pungency to the taste from a large mass of it, when fresh drawn; which, however, is neither fetid nor sulphureous.

4. When hot from the pump, it affects the mouth with a strong chalybeate impression, without being of a saline or pungent taste; and,

5. On growing cold, the chalybeate taste is entirely lost, leaving only a very slight sensation on the tongue, by which it can scarcely be distinguished from common hard spring water.

In *specific gravity*, the waters of the King's, or Hot Bath, and that of the Cross Bath, exceed all other cold or warm springs of that city; the former being one-tenth, and the latter one-twelfth part of a thousand, heavier than the water in the river Avon.

The temperature of the King's Bath water, which is usually preferred for drinking, is, when fresh drawn in the glass, above 116°; that of the Cross Bath 112°. But after flowing into the spacious bathing vessels, it is generally from 100 to 106° in the hotter baths, and from 92 to 94° in the Cross Bath; a temperature which remains nearly stationary, and is greater than that of any other natural spring in Britain. A small quantity of gas is also disengaged from these waters which Dr. Priestley first discovered to contain no more than one-twentieth part of its bulk of fixed air, or carbonic acid. The chemical properties of the Bath waters have been fully analyzed by the ingenuity of Drs. Lucas, Falconer, and Gibbs; according to whose descriptions they contain so small a proportion of iron, as to amount only to 1-20th or 1-38th of a grain in the pint; and, according to Dr. Gibbs, fifteen grains and a quarter of siliceous earth, in the gallon.

According to the experiments of Dr. Bryan Higgins, a Winchester gallon of Bath water contains,

	dwt.	*gr.*
Of calcareous earth, combined with vitriolic acid, in the form of selenite	0	$319\frac{1}{10}$
Of calcareous earth, combined with acidulous gas - - - - -	0	$22\frac{4}{10}$
Of marine salt of magnesia - - -	0	$22\frac{1}{10}$
Of sea salt - - - - - -	1	$14\frac{8}{10}$
Of iron, combined with acidulous gas -	0	$0\frac{1}{10}$

Acidulous gas, besides what is contained in the above earth and iron, twelve ounces measure; and atmospheric air two ounces.

Dr. Monro, in speaking of these waters, says, the highest degrees of heat attributed to them by Doctors

	Howard	Charlton	Lucas, are from	
The King's bath	113	116	119	Of Farenheit's thermometer.
The Hot bath	114	116	119	
The Cross bath	103	110	114	

And that, on evaporation, a gallon of them has been found to contain, of iron $\frac{3}{37}$ or $\frac{3}{38}$ parts of a grain; of calcareous earth $22\frac{1}{2}$ grains; selenites $31\frac{1}{2}$ grains; Glauber's salt $25\frac{2}{3}$ grains; sea-salt $51\frac{1}{3}$ grains; which were mixed with an oily matter, but not more so than is common to all waters. From this and other accounts, he conceives that the Bath waters are chalybeates, in which iron and earth are kept suspended by means of carbonic acid; and that they are impregnated with the medicinal substances here mentioned.

Dr. Saunders, of London, in his treatise "*On Mineral Waters*," estimates a gallon of the King's Bath water to contain about eight cubic inches of carbonic acid, and a similar quantity of air, nearly azotic; farther, about eighty grains of solid ingredients, one-half of which probably consists of sulphat and muriat of soda; $15\frac{1}{2}$ grains of siliceous earth, and the remainder is selenite, carbonate of

lime, and so small a portion of oxyd of iron, as to be scarcely calculable. Hence he concludes, that the King's Bath water is the strongest chalybeate: next in order, the Hot Bath water; and lastly, that of the Cross Bath, which contains the smallest proportions of chalybeate, gaseous, and saline, but considerably more of the earthy particles; while its water in the pump is also two degrees lower than that of the others. It is likewise now ascertained, that these springs do not exhibit the slightest traces of sulphur, though it was formerly believed, and erroneously supported on the authority of Dr. Charleton, that the subtile aromatic vapour in the Bath waters was a sulphureous principle, entirely similar to common brimstone.

With regard to the effect of the Bath waters on the human system, independent of their specific properties, as a medicinal remedy not to be imitated completely by any chemical process, he attributes much of their salubrious influence to the natural degree of *warmth* peculiar to these springs; which, for ages, have preserved an admirable *uniformity* of temperature. He thinks too, that one of their most important uses, is that of an *external* application; yet supposes that, in this respect, they appear to differ little from common water, when heated to the same temperature, and applied under similar circumstances.

According to Dr. Falconer, the Bath water, when drank fresh from the spring, generally raises, or rather accelerates the pulse, increases the heat, and promotes the different secretions. These symptoms, in most cases, become perceptible soon after drinking it, and will sometimes continue for a considerable time: it is, however, remarkable, that they are only produced in invalids. Hence we may conclude, that these waters not only possess heating properties, but their internal use is likewise attended with a peculiar stimulus, acting more immediately on the nerves.

One of the most salutary effects of the Bath water, consists in its action on the urinary organs, even when taken in moderate doses. Its operation on the bowels varies in different individuals, like that of all other waters which do not contain any cathartic salt; but, in general, it is productive of costiveness, an effect resulting from the want of an active stimulus to the intestines, and probably also from the determination this water occasions to the skin, more than from any astringency which it may possess. For, if perspiration be suddenly checked during the use of it, a diarrhœa is sometimes the consequence. Hence it appears that its stimulant powers are primarily, and more particularly exerted in the stomach, where it produces a variety of symptoms, sometimes slight and transient, but occasionally so considerable and permanent, as to require it to be discontinued. In those individuals with whom it is likely to agree, and prove beneficial, the Bath waters excite, at first, an agreeable glowing sensation in the stomach, which is speedily followed by an increase of both appetite and spirits, as well as a quick secretion of urine. In others, when the use of them is attended with headach, thirst, and constant dryness of the tongue, heaviness, loathing of the stomach, and sickness, or, if they are not evacuated, either by urine, or an increased perspiration, it may be justly inferred, that their farther continuance is improper.

Before we conclude this article, one caution may be necessary: many patients and invalids are apt to desist from the *internal* use of the Bath water, as soon as they perceive that it raises the pulse, and excites a preternatural degree of heat, with other symptoms of fever. On such occasions, however, medical men must determine, whether these effects are to be ascribed to a favourable effort of Nature, by which she endeavours to expel something from the body, that is incompatible with its healthy state. And as there is an essential difference between a spontaneous fever, and one occasioned by accident, or intemperance, it will next be necessary to consider, how far the latter may be accompanied with inflammatory symptoms, which ought to be counteracted; or whether the whole should be attributed to a beneficial crisis, effected by the use of the waters, and in the progress of which Nature should be assisted, rather than interrupted.

The fashionable *season for drinking the Bath waters*, is in the winter, but, medically speaking, it is whenever they are wanted; for there is little or no sensible difference in them at any one time compared with another. Many who have drank them for some time, leave them off for a month in the hottest weather; but cold constitutions need not, for they find them rather better at that time. With some persons cold weather suits the best with their drinking it, especially when the season is dry; and in clear frost it is the best of all. In almost all cases some mild purgative should precede their use. More than two pints in a day can never be required, which may be drank at three or four times, a few hours intervening betwixt each portion; and in such chronical diseases as require preparations of iron, the artificial ones may at the same time be used.

BATHING, the act of using or applying a bath; that is, of immerging the body, or part of it, in water or some other fluid. Bathing is a practice of great antiquity. The Greeks, as early as the heroic ages, are said to have bathed themselves in the sea, in rivers, &c. We even find mention in Homer of hot-baths in the Trojan times; but these seem to have been very rare, and only used on extraordinary occasions. Athenæus speaks of hot-baths as unusual even in his age. In

reality, public baths appear to have been discouraged, and even prohibited, by the ancient Greeks, who were contented to wash themselves at home in a sort of bathing-tubs. The method of bathing among the ancient Greeks was, by heating water in a large vessel with three feet, and thence pouring it on the head and shoulders of the person seated in a tub for that purpose, who was also anointed with oil on coming out.

The Romans were also long before they came into the use of baths; the very name of which, *thermæ*, shows they borrowed it from the Greeks. As the ancient Romans were chiefly employed in agriculture, their custom was, every evening after work, to wash their arms and legs, that they might sit down to supper with more decency: for it is to be observed, the use of linen was then unknown; and the people of that age went with their arms and legs bare, and consequently exposed to dust and filth. But this was not all; for every ninth day, when they repaired to the city, either to the nundinæ, or to attend at the assemblies of the people, they bathed all over in the Tiber, or some other river which happened to be nearest them. This seems to have been all the bathing known till the time of Pompey, when the custom began of bathing every day. The Celtic nations were not without the use of bathing: the ancient Germans bathed every day in warm water in winter, and in cold in summer. In England, the famous bath which gives its own name to the city in which it exists, is said by some to have been in use 800 years before Christ. Of this, however, it must be owned we have but very slender evidence; though Dr. Musgrave makes it probable that it was a place of considerable resort in Geta's time; there being still the remains of a statue erected to that general, in gratitude for some benefactions he had conferred upon it.

Yet although, among the ancients, bathing made as it were, a part of the diet, and was used as familiarly as eating or sleep, it was not altogether devoted to the purposes of luxury or even of cleanliness; for it was likewise in great esteem among their physicians for the cure of diseases, as appears from Strabo, Pliny, Hippocrates, and Oribasius; whence frequent exhortations to washing in the sea, and plunging into cold water. The first instance of cold bathing, as a medicine, is Melampus's bathing the daughters of the king of Argos; and the first instance of warm bathing is Medea's use of it, who was said to boil people alive, because Pelias, king of Thessaly, died in a warm bath under her hands. The cold bath was used with success by Antonius Musa, physician to the Emperor Augustus, for the recovery of that prince; but fell into neglect after the death of Marcellus, who was thought to have been destroyed by the improper use of it. It was again brought into request towards the close of the reign of Nero, by means of a physician of Marseilles named Charmis; but during the ignorance of the succeeding ages, the practice was again banished for a long time. Both hot and cold bathing are now prescribed in many cases by the physicians, though they are not exactly agreed as to the manner in which these operate in the cure or relief of diseases.

Bathing among the Turks, as among the ancients, makes an important part of diet and luxury; so that in every town, and even village, there is a public bath. Indeed, the necessity of cleanliness, in a climate where the body perspires so copiously, has rendered bathing indispensable: the comfort it produces preserves the use of it; and Mahomet, who knew its utility, has reduced it to a precept. Of these baths, and the manner of bathing, particularly at Cairo, the following account is given in the Letters on Egypt published by M. Savary.

"The first apartment one finds in going to the bath, is a large hall, which rises in the form of a rotunda. It is open at the top, to give a free circulation to the air. A spacious estrade, or raised floor, covered with a carpet, and divided into compartments, goes around it, on which one lays one's clothes. In the middle of the building, a jet-d'eau spouts up from a bason, and agreeably entertains the eye. When you are undressed, you tie a napkin round your loins, take a pair of sandals, and enter into a narrow passage, where you begin to be sensible of the heat. The door shuts to, and, at twenty paces off, you open a second, and go along a passage, which forms a right angle with the former. Here the heat increases. They who are afraid of suddenly exposing themselves to a stronger degree of it, stop in a marble hall, in the way to the bath properly so called. The bath is a spacious and vaulted apartment, paved and lined with marble, around which there are four closets. The vapour incessantly rising from a fountain and cistern of hot water, mixes itself with the burning perfumes. These, however, are never burnt except the persons who are in the bath desire it. They mix with the steam of the water, and produce a most agreeable effect.

"The bathers are not imprisoned here, as in Europe, in a sort of tub, where one is never at one's ease. Extended on a cloth spread out, the head supported by a small cushion, they stretch themselves freely in every posture, whilst they are wrapped up in a cloud of odoriferous vapours, which penetrates into all their pores. After reposing there some time, until there is a gentle moisture over the whole body, a servant comes, presses you gently, turns you over, and when the limbs are become supple and flexible, he makes all the joints crack without any difficulty. He *masses*

and seems to knead the flesh without making you feel the smallest pain. This operation finished, he puts on a stuff glove, and rubs you a long time. During this operation, he detaches from the body of the patient, which is running with sweat, a sort of small scales, and removes even the imperceptible dirt that stops the pores. The skin becomes soft and smooth like satin. He then conducts you into a closet, pours the lather of perfumed soap upon your head, and withdraws.

"After being well washed and purified, you are wrapped up in hot linen, and follow the guide through the windings that lead to the outer apartment. This insensible transition from heat to cold prevents one from suffering any inconvenience from it. Coming at last out of a stove where one was surrounded by a hot and moist fog, where the sweat gushed from every limb, and transported into a spacious apartment open to the external air, the breast dilates, and one breathes with voluptuousness. Perfectly massed, and as it were regenerated, one experiences an universal comfort. The blood circulates with freedom; and one feels as if disengaged from an enormous weight, together with a suppleness and lightness to which one has been hitherto a stranger. A lively sentiment of existence diffuses itself to the very extremities of the body. Whilst it is lost in delicate sensations, the soul, sympathising with the delight, enjoys the most agreeable ideas. The imagination, wandering over the universe, which it embellishes, sees on every side the most enchanting pictures, every where the image of happiness. If life be nothing but the succession of our ideas, the rapidity with which they then recur to the memory, the vigour with which the mind runs over the extended chain of them, would induce a belief that, in the two hours of that delicious calm that succeeds the bath, one has lived a number of years."

The experiments made by Count Rumford in his own person, and detailed in his thirteenth Essay "On Warm Bathing," sufficiently prove that the construction of warm baths, and the general practice of warm bathing *as a rational luxury* would conduce no less to the public health, in northern than in hot climates. Indeed, in no situation would they prove more salutary than in our own island, where vicissitudes of temperature and of weather are yearly cutting off, by consumptions, and other maladies fairly attributable to these causes, the fairest and most hopeful of the rising generation. In order to facilitate the introduction of this salutary practice, the Count gives the following directions for the construction of a warm bath upon scientific principles. He says,—

"The bath-room should be built of bricks; and should be covered above by a gothic or pointed dome; and the entrance into it should not be through the side walls, but through the pavement, by a flight of steps from below. The walls should be double, the inner wall being made as thin as possible, and the room should be lighted by three or four very small double windows of single panes of glass situated just below the spring of the dome, which might be at the height of seven or eight feet above the pavement.

"As the (double) walls of the building would be of some considerable thickness, and as the windows ought to be small, and double, it would be very easy to construct them in such a manner that a person from without should not be able to see any person in the bath, even though they were to get a ladder, and attempt to look in at the window. One of the windows should be made to open, in order to ventilate the bath. The inside of the walls, and dome of the bath-room should be plastered, and afterward well painted in oil;—or, (what would have a neater and more elegant appearance), they might be lined with Dutch tiles. The pavement might be made of any kind of flat stones, or of bricks, or tiles; or it might be constructed of stucco, well painted in oil, and it might be covered with matting.

"If ornament were required, I would place a figure of Vesta, holding an Argand's lamp, on a pedestal, on one side of the room. This pedestal, which should be large in proportion to the figure, should be made of sheet copper, and painted of a bronze colour on the outside. The cavity within it should be accurately closed on every side, in order that it might occasionally be filled with steam from a boiler situated without, and used as a stove for warming the room.

"The important object had in view in making the entrance into this bath from below (the preservation of the warm air in the room), might be attained equally well with the door placed on one side of the room, provided the door were made to open immediately into a narrow descending vaulted gallery, furnished with a good door at the lower end of it. The top of the door at the lower end of this gallery should be two or three feet below the level of the bottom of the door at the top of it, which opens into the bath. By setting both these doors open; and at the same time opening one of the windows of the bath, all the warm air in it, below the level of the window, will be forced out, in a very few moments, and the room will be completely ventilated.

"If the entrance be made through the side of the room, in the manner just described, this will render the form of the room more simple, and more elegant, than if the passage into it were from below, through the pavement. If the pavement of the bath be on a level, or nearly on a level, with the surface of the ground, the entrance into it must, nevertheless, come from a lower place. If the door leading into the bath be situated at one

side of the room, the vaulted gallery, with which it communicates, must descend below the level of the surface of the ground, and a passage must be opened from without, in order to arrive at the door which must close this gallery at its lower extremity.

"A steam-boiler should be placed under the bath, in a vaulted room, and the smoke from the closed fire-place of the boiler should be made to circulate in flues under the pavement of the bath, near the walls of the room, in which part the pavement should not be covered with matting.

"A bathing tub should stand on one side of the room, and opposite to it should be placed a bamboo or caned sopha, covered, first with a soft thick blanket, and then with a clean sheet, thrown over it. The bathing tub, which might be of the usual dimensions, should be placed on a platform of wood, covered with sheet lead, about seven or eight feet square, and raised six or seven inches above the pavement. This platform should be flat, and nearly horizontal, with a border all round it, about two or three inches high, and a leaden pipe at the lowest part of it, to carry off the water that happens to fall on it. The lead should be covered by thin boards, or by a loose piece of matting; and a caned chair, or a stool, should be placed on the platform, by the side of the bathing tub. A pipe should be prepared for admitting cold water into the bathing tub from a reservoir situated without the bath; and another for bringing steam into it, to heat it, from the steam boiler. There should likewise be a waste pipe for carrying off the water when the bathing tub is emptied. The bathing tub should not be set down immediately upon the lead which covers the platform on which the tub is placed, but should be raised eight or ten inches above it, in order that the air may pass freely under the bottom of the tub; and that there may be room to come at the lead, to wash it, and clean it, in every part.

"A bath constructed in the manner here described might be kept constantly warm, all the year round, at a very small expence for fuel; and in that case, it would always be ready for use. It is equally well calculated to serve as a warm air-bath;—as a vapour-bath;—or as a warm-water-bath;—and when it is used as a water-bath, the air in the room may be made either warm, or temperate, at pleasure."

Count Rumford describes another bath on a less expensive, and more modest plan.

"Let a small building be erected, fourteen feet five inches long, and nine feet wide, measured within, and seven feet high; and let it be divided into equal rooms of nine feet long, and seven feet wide each, by a wall of brick four inches and a half wide, or equal in thickness to the width of a brick. Let the outside walls of this little edifice be double, the two walls being each the width of a brick in thickness, and the void space between them being likewise of the same thickness, viz. about four inches and a half. In order to strengthen these double walls, they may be braced and supported one against the other, by uniting them, in different parts, by single bricks, laid across, with their two ends fixed in the two walls.

Instead of a floor of boards, these two little rooms should be paved with twelve inch tiles, or flat stones, laid in such a manner, on thin parallel walls, (four inches and a half in thickness) as to form horizontal flues under every part of the pavement.

There should be no door of communication between these rooms, but each should have its separate entrance from without, by a door opening directly into a separate narrow descending covered gallery. These two doors should be placed on the same side of the building, and their two separate descending galleries may be parallel to each other, and may indeed be covered by the same roof. They may together form one gallery, divided into two narrow passages by a thin partition wall, constructed with bricks. A small porch at the bottom of the gallery should be common to both passages, but each passage should, nevertheless, have its separate door, at its lower extremity, where it communicates with the porch. The top of the door-way of this descending passage, at its lower extremity, must be at least one foot below the level of the pavement of the rooms. This passage may be furnished with a flight of steps; or its descent may be made so easy as to render steps unnecessary.

"If there should be no natural elevation of ground at hand, on which this bath can conveniently be situated, a mound of earth must be raised for that purpose; otherwise it will be necessary that the porch at the end of the gallery should be situated seven or eight feet below the surface of the ground; for it is indispensably necessary that the entrance into the bath should be by an *ascent*, and in a *covered gallery*.

"The building may be covered with a thick thatched roof, which will, on some accounts, be better than any other; but any other kind of roof will answer very well, provided it be tight; and that a quantity of straw, or of chaff, or of dry leaves, be laid over the ceiling of the two small rooms, under the roof, to confine the heat. The ceiling of the rooms should be lathed and plastered, and the walls of the room should be plastered and white-washed.

"At the end of one of the rooms opposite to the door, a bathing-tub should be placed; and in the other a caned sofa. The bathing tub should be placed on a platform seven feet square, covered with sheet lead, and raised about nine inches above

the level of the pavement. This platform should have a rim all round it, and a pipe for carrying off, out of the room, the water that accidentally falls on it. The bathing tub should be supplied with cold water from a reservoir (a common cask will answer perfectly well for that use), which should stand without the house.

"The water should be admitted cold into the bathing tub, and should be warmed in it, by means of steam, which may come from a small steam-boiler, which should be situated without the building, and near to the reservoir of cold water. A small open shed, made against one side of the building—that side of it which is opposite to the entrance gallery—may cover both the boiler and the reservoir. The boiler, which need not be made to contain more than six or eight gallons, should be well set in brick-work, and well covered over with bricks, to prevent the loss of heat which would result from any part of the boiler being exposed naked to the cold air of the atmosphere. This boiler should be fitted up, by means of a ball-cock, so as to feed itself regularly with water from the neighbouring reservoir.

"The boiler should be furnished with a safety-valve, opening into the open air, and with a tube for conveying steam into the bathing tub. This tube, which may be a common leaden pipe, about half an inch in diameter, should be wound round with the list of coarse cloth, or with any warm covering of that sort, to confine the heat. This steam tube should rise up perpendicularly from the boiler to the height of eight or ten inches above the level of the ceiling of the bath-room, and should then be bent towards the building, and made to enter the roof of it, and then to descend perpendicularly through the ceiling of the bath-room, and enter the bathing tub. Its open end should reach to within an inch of the bottom of the tub; and, a little above the level of the top of the tub, there should be a steam-cock, by means of which the passage of the steam through the steam tube, and into the water in the bathing-tub, may be regulated, or prevented entirely, as the occasion may require.

"There may be a short branch, six or eight inches long, inserted into the steam-tube just described, which branch will serve for admitting steam into the room when it is designed to be used as a steam, or vapour-bath. This short branch must of course be furnished with its own separate steam-cock.

"The smoke from the (closed) fire-place of the boiler must be made to circulate under the pavement of the two rooms of the bath, in the flues constructed for that purpose, before it is suffered to pass off into the chimney. The chimney should stand on the outside of the building, and be made to lean against, and be supported by the wall of the building. There should be a damper in this chimney.

"Each of the small rooms should be furnished with a small double window; each window consisting of one large pane of glass, and being made to open by means of a hinge, placed on one side of it. These windows should be placed as near the ceiling of the room as possible, in order to facilitate the perfect and speedy ventilation of the bath. The inside windows may be placed level with the inside of the wall of the house; and the outside window level, or flush, with the outside wall. Either the inside windows or the outside windows should be made of ground or of wavy glass, in order that a person in the bath may not be exposed to view through the windows.

"The two small rooms may be distinguished by calling one of them the *bath-room*, and the other the *dressing-room*.

"If it be required to heat the two rooms in a very short time, the one with vapour, and the other with dry air, equally warmed, and perfectly free from all disagreeable smells, this may be done by the following simple contrivance. Let a cylinder of very thin copper, about eight inches in diameter, and five feet in length, be placed horizontally under the sopha in the dressing-room, and let a steam-pipe from the boiler be laid into it, with another pipe for carrying off the water resulting from the condensation of the steam in it. By admitting steam into this tube, the air in the room will soon be warmed, without any watery vapour being mixed with it: and by admitting steam into the bath-room, and allowing it to mix with the air of that room, a vapour-bath will be formed, and in a very few minutes will be ready for use."

A most valuable and curious discovery of Count Rumford is, that the popular notion of *danger from catching cold after the warm-bath*, is utterly groundless. The contrary is really the fact; since the use of the warm-bath *arms the system* no less against the *immediate sense*, than the *ultimate injuries*, commonly experienced from exposure to cold. See Essay xii. p. 430.

BATHRON, (βαθρον), or *bathrum*, a seat, or support. It is also the scamnum of Hippocrates, that is, an instrument invented for the extension of fractured limbs. Oribasius and Scultetus both describe it.

BATHS, DRY, are those made of ashes, salt, sand, &c. &c. The ancients had many ways of exciting a sweat, by means of a dry heat; as by the use of hot sand, stove-rooms, or artificial bagnios, and even from certain natural hot steams of the earth, received under a proper arch, or hot-house, as we learn from Celsus. They had also another kind of bath by insolation, where the body was

exposed to the sun for some time, in order to draw forth the superfluous moisture from the inward parts; and to this day it is a practice in some nations to cover the body over with horse-dung, especially in painful chronic diseases. In New England, they make a kind of stove of turf, wherein the sick are shut up to bathe or sweat. It was probably from a knowledge of this practice, and of the exploded doctrines of Celsus, that the noted empiric Dr. Graham drew his notions of the salutary effects of what he called *earth-bathing*, a practice which, in the way he used it, consigned some of his patients to a perpetual mansion under ground!

The like name of *dry* bath is sometimes also given to another kind of bath, made of kindled coals, or burning spirit of wine; the patient being placed in a convenient close chair for the reception of the fume, which rises and provokes sweat in a plentiful manner: care being here taken to keep the head out, and to secure respiration. This bath has been found very effectual in removing old obstinate pains in the limbs.

Dry bathing of this latter kind is nearly similar to a process employed in medicine termed *fumigation*, in which the dry vapours of minerals and other substances being applied to the skin, the absorbent vessels take up and convey into the blood the subtle parts that come in contact with their mouths or orifices. By the subtle fumes thus received, much benefit or prejudice may be produced, according to the nature of the case, and the constitution on which its effects are to be exerted; as is evident from the palsies produced among water-gilders, workers in lead-mines, &c. and also from the benefits received in many cases when the air is impregnated with salutary materials. Catarrhs and colds, (see INHALER) are relieved by fumes received with the breath; and, by the same method, expectoration is assisted in the asthma; and even ulcers in the lungs are said to have been relieved by this expedient. But this is still more strongly exemplified by the common practice of curing venereal ulcers, and exciting the general action of quicksilver in the system, by inclosing the naked body of the patient in a box fitted to receive the fumes of quicksilver, raised by sprinkling cinnabar upon a red hot iron, or, what is still better, the *hydrargyrus præcipitatus cinereus*, of the Pharmacopœia Chirurgica, which, not emitting any sulphureous vapours like the other, proves less inconvenient to the patient.

BATHS, MEDICATED; are those saturated with various mineral, vegetable, or sometimes animal substances. Thus we have sulphur and iron baths, aromatic and milk baths: there can be no doubt, that such ingredients, if duly mixed, and a proper temperature be given to the water, may, in certain complaints, be productive of effects highly beneficial. Pompous reports were published several years ago, by two notorious empirics, and attested by many of our first nobility, who permitted their names to be bandied about publicly, in consequence of wonderful cures said to have been performed by the most whimsical combinations of things and circumstances. We are now fully justified, however, in questioning the truth of these specious cures; at least, it must be thought remarkable, that such extraordinary facts, if they were facts, should, in the course of a few years, so far from being improved upon, and rendered of practical service to suffering humanity, have been totally consigned to oblivion; like fiery meteors, these mysterious masters of the healing art, their medicines and patients, all having disappeared. Notwithstanding this unfavourable result, however, it would be unreasonable to impute the want of success to the inefficacy of medicinal substances, or the baths themselves; on the contrary, we may venture to suppose, that both will operate, when properly used, in an uniform manner, so long as the nature of man, and diseases, are conformable to general laws. Hence our success will always less depend upon the specific *virtues* of substances, or drugs, than upon the *manner* in which they are used for particular purposes.

Water impregnated with the salt or vitriol of iron, will abound with the bracing and sulphureous particles of that metal, and may be useful for strengthening the part to which it is applied; reinvigorating debilitated limbs; stopping various kinds of bleeding; restoring the menstrual and hemorrhoidal discharges, when obstructed; and, in short, as a substitute for the natural iron-bath. In the vicinity of smelting works, large quantities of the slag of copper, antimony, and cobalt, are generally thrown away as useless; but these substances contain a considerable portion of sulphur and vitriolic acid, combined with an earthy base, which renders them valuable in baths designed for bracing and giving tone to the weak fibres, or relaxing them when they are preternaturally rigid. Besides, such baths are possessed of detersive properties, so that they may be used with advantage in topical cases, if due regard be paid to existing circumstances. In preparing such artificial baths, however, the slags ought to be thrown into the water immediately after they are taken from the furnace, or they should be previously heated: these preparations may then be used, occasionally, either in the form of baths, or fomentations.

There are various other medicated baths, such as those prepared with alum and quick-lime, sal ammoniac, &c. by boiling them together or separately in pure rain water: these have long been reputed as eminently serviceable in paralytic and all diseases arising from nervous and muscular debility. Lastly,

it is worthy of remark, that all mineral waters presented to us by the beneficent hand of Nature, may be artificially prepared, with tolerable accuracy, and sometimes of superior efficacy, when we are sufficiently acquainted with the component parts of such springs.

BATHS, VAPOUR. In these, the steam of some decoction is received upon the body, to promote a perspiration, or to act medicinally by absorption, or otherwise. They are also by some called *balnea laconica*. *Vapour* baths are so called when the patient is not plunged into what is prepared for the bath, but only receives its steam upon those parts of his body which require it; as in some diseases of the anus and womb, where the patient sits and receives the fumes of some proper fomentation, &c. To these may be added the bagnio; where people are made to sweat by the heat of a room, or the affusion of hot water; after which they generally go into a hot bath.

A peculiar sort of vapour was much used by the ancient Mexicans, and is still in use among the present Indians, their descendants. According to the abbé Clavigero, these baths are built of raw bricks, and their form is similar to that of ovens for baking bread; but with this difference, that the pavement of the bath is a little convex, and lower than the surface of the earth; whereas that of most ovens is plain, and a little elevated for the accommodation of the baker. The greatest diameter of a bath is about eight feet, and its greatest height six. The entrance, like the mouth of an oven, is wide enough to allow a man to creep easily in. In the place opposite to the entrance there is a furnace of stone or raw bricks, with its mouth outwards to receive the fire, and a hole above it to carry off the smoke. The part which unites the furnace to the bath, and which is about two feet and a half square, is shut with a certain dry stone of a porous texture. In the upper part of the vault there is an air-hole, like that to the furnace. This is the usual structure of the temazcalli; but there are others that are without vault or furnace, mere little square chambers, yet well covered and defended from the air. When any person goes to bathe, he first lays a mat within the temazcalli, a pitcher of water, and a bunch of herbs or leaves of maize. He then causes a fire to be made in the furnace, which is kept burning until the stones which join the bath and furnace are quite hot. The person who is to use the bath enters commonly naked, and generally accompanied, for the sake of convenience, or on account of infirmity, by one of his domestics. As soon as he enters, he shuts the entrance close, but leaves the air-hole at top for a little time open, to let out any smoke which may have been introduced through the chinks of the stone: when it is all out, he likewise stops up the air-hole. He then throws water upon the hot stones, from which immediately arises a thick steam to the top of the temazcalli. While the sick person lies upon the mat, the domestic drives the vapour downwards, and gently beats the sick person, particularly on the ailing part, with the bunch of herbs, which are dipped for a little while in the water of the pitcher, which has then become pretty warm. The sick person falls immediately into a soft and copious sweat, which is increased or diminished at pleasure, according as the case requires. When the evacuation desired is obtained, the vapour is let off, the entrance is cleared, and the sick person clothes himself, or is transported on the mat to his chamber; as the entrance to the bath is usually within some chamber of his habitation. This sort of bath, called temazcalli by the natives, has been regularly used in several disorders, particularly in fevers. The Indian women use it commonly after childbirth, and also those persons who have been stung or wounded by any poisonous animal. It is undoubtedly a powerful remedy for all diseases which arise from suppressed perspiration, as colds, catarrhs, &c. and certainly would be highly and generally useful in all countries where the climate is variable, or the rheumatism a frequent disease. When a very copious sweat is desired, the sick person is raised up and held in the vapour; as he sweats the more the nearer he is placed to it. The temazcalli is so common, that in every place inhabited by the Indians there are many of them.

BA'THYS, (*βαθυσ*), a sort of cheese formerly used in Rome.

BA'TIS, a genus in Linnæus's botany. It hath but one species.

BATRACHI'TES, (*βατραχιτης*), the fossil substances called toad-stones.

BATRA'CHIUM. See GERANIUM BATRACHIOIDES.

BA'TRACHUS, (from *βατραχος*, *a frog*); an inflammatory tumor, which rises under the tongue, especially of children. Aetius says it is a tumor under the tongue, especially in the veins. See RANULA.

BATTARI'SMUS, stammering with hesitation, or, difficulty to begin a word. It is the *psellismus hæsitans* of Cullen.

BATTITU'RA, the squamous scales of metals which fly off whilst under the hammer.

BAUHI'NIA, mountain ebony, a genus in Linnæus's botany. He enumerates eight species.

BAULDMONEY. See MEUM ATHAMANTICUM.

BAUM. See MELISSA.

BAURAC, a name for the mineral fixed alkaline salt. It is the Arabic name for nitre, or, for any salt; and hence it is, that *Borax* took its name, which is also thus called.

BAXA'NA, a tree in an island near Ormus, the smallest quantity of whose fruit is said to suffocate the person who tastes it: yet in other countries,

the root, leaves, and fruit, are antidotes to poison. It is also called *Rabuxit.*

BAY-CHERRY. See Lauro-cerasus.

BAY-LEAVES. See Laurus.

BAY-LEAVED PASSION FLOWER. The plant so called, is the *Passiflora laurifolia* of Linnæus, a native of Surinam, where the fruit grows to the size of a small lemon, which it greatly resembles. Its flavour is delicately acid, and much esteemed to quench the thirst. It strengthens the stomach, and is a salutary fruit in gastric affections, fevers, &c.

BAZCHER, a Persian word signifying an antidote.

BDELLIUM, (βδέλλιον; according to some derived from bedallah, Arabic); a gummy resinous juice, produced by a tree in the East Indies, of which we have no satisfactory account. It is brought into Europe both from the East Indies and Arabia. It is in pieces of different sizes and figures, externally of a dark reddish brown, somewhat like myrrh; internally it is clear, and not unlike to glue; to the taste it is slightly bitter and pungent; its odour is very agreeable. If held in the mouth, it soon becomes soft and tenacious, sticking to the teeth. Laid on a red-hot iron, it readily catches flame, and burns with a crackling noise, and in proportion to its goodness it is more or less fragrant. Near half of its substance dissolves either in water or in spirit of wine; but the tincture made with spirit is somewhat stronger, and by much more agreeable. Vinegar, or verjuice, dissolves it wholly. The simple gum is a better medicine than any preparation from it. Though one of the weakest of the deobstruent gums, it is sometimes used as a pectoral, and an emmenagogue, with advantage. The colleges, however, have rejected it.

BEAD-TREE, *azederach*, or melia, in botany, a genus of the *decandria monogynia* class. Its characters are these: the flower has five spear-shaped petals which spread open, and a cylindrical *nectarium* of one leaf, indented at the brim in ten parts. It has ten small stamina inserted in the top of the *nectarium;* with a conical *germen*, which turns to a soft globular fruit, including a roundish nut, having five rough furrows and five cells, each containing one oblong seed. There are two species.

BEAN. The common bean is the seed of the *vicia faba* Linn. a native of Egypt. There are many varieties cultivated in our gardens, but their properties are very similar. Beans are very wholesome and nutritious to those whose stomachs are strong and accustomed to the coarser modes of living. In delicate stomachs they produce flatulency, dyspepsia, cardialgia, &c. especially when old. See Legumina.

BEAN, KIDNEY, often called the *French* bean; the pericarpium of the *phaseolus vulgaris* Linn. which when young and well boiled is easy of digestion and delicately flavoured. These are less liable to produce flatulency than peas. See Legumina.

BEAN, MALACA. See Anacardium orientale.

BEAN, St. IGNATIUS'S. See Faba indica.

BEARD, the hair growing on the chin and adjacent parts of the face, in adults of the male sex. A noted painter in Germany, called *John Mayo*, had such a large beard that he was nicknamed *John the Bearded.* We are told it was so long that he wore it fastened to his girdle; and, though he was a very tall man, it would hang upon the ground when he stood upright. He took the greatest care of this extraordinary beard, and sometimes he would untie it before the Emperor Charles V. who took great pleasure to see the wind make it fly against the faces of the lords of his court.

This appendage to the human countenance is not, however, confined to men. To say nothing of slight and unwelcome appearances of hair on the chins of the other sex, we have accounts, upon record, of *bearded women;* these, it is said, have been all observed to want the menstrual discharge; and several instances are given by Hippocrates, and other physicians, of grown women, especially widows, in whom, at the decline of the menses, beards appeared. Eusebius Nierembergius mentions a woman who had a beard reaching to her navel. Of women remarkably bearded we also have several other instances. In the cabinet of curiosities of Stutgard in Germany, there is the portrait of a woman called *Bartel Graetje*, whose chin is covered with a very large beard. She was drawn in 1587, at which time she was but 25 years of age. There is likewise in the same cabinet another portrait of her when she was more advanced in life, but likewise with a beard. It is said, that the Duke of Saxony had the portrait of a poor Swiss woman taken, remarkable for her long bushy beard; and those who were at the carnival at Venice, in 1726, saw a female dancer astonish the spectators not more by her talents than by her chin covered with a black bushy beard. Charles XII. had in his army a female grenadier: it was neither courage nor a beard that she wanted, to be a man. She was taken at the battle of Pultowa, and carried to Petersburg, where she was presented to the Czar in 1724: her beard measured a yard and a half. We read in the Trevoux Dictionary, that there was a woman seen at Paris, who had not only a bushy beard on her face, but her body likewise covered all over with hair. Among a number of other examples of this nature, that of Margaret, the governess of the Netherlands, is very remarkable. She had a very long stiff beard, which she prided herself on; and being persuaded that it contributed to give her an air of majesty, she took

care not to lose a hair of it. This Margaret was a very great woman. It is said, that the Lombard women, when they were at war, made themselves beards with the hair of their heads, which they ingeniously arranged on their cheeks, in order that the enemy, deceived by the likeness, might take them for men. It is asserted, after Suidas, that in a similar case the Athenian women did as much.

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For persons in the higher and middle classes of life, whose limited exercise and luxurious habits render their sleep more precarious than that of the labourer, beds of a more delicate texture are required; but even in these, an excess of delicacy tends to the destruction of health. Dr. Willich observes that a mattress filled with horse-hair is preferable to a feather-bed, which, he says, heats and relaxes the body, and disposes it to pulmonary and hectic complaints. "The bolster should be stuffed with horse-hair, and covered with a small pillow filled with feathers. The bedding might consist either of sheets, with blankets and a counterpane, or a single cover, thinly quilted with cotton wool; the latter might be easily washed, and will last for several years. In very cold seasons, a counterpane quilted with a few pounds of soft feathers, might be substituted for the former; but it should not be used in summer."

With regard to the apartment, or chamber, in which we sleep, he says: "those happy few who, from their respective situations in life, are enabled to choose a spacious and lofty room for breathing in, for the period of, at least, one-third of their existence, may consider themselves peculiarly fortunate." It must, however, be confessed, that little attention is generally paid to this important object, even by such persons as might, in this respect, equally consult their health and convenience.

A bed-chamber ought never to be on a ground-floor, or to have a northern aspect. Although, on account of a cooler air, many prefer this situation in summer, yet it cannot fail to be unwholesome,

as it is most exposed to the influence of a damp atmosphere in the morning, and during the night. Hence it is the universal opinion, that a southern front is more conducive to health; because it receives the warm rays of the sun, particularly in winter, the most trying season for valetudinarians. Small closets and concealed beds are extremely injurious, especially to young people and to invalids. When persons are from necessity obliged to sleep in them, it will be advisable every morning, immediately after rising, to displace all the bed-clothes; and, if the sky be serene, to open the door and windows, in order to purify the stagnant air of so confined a resting place. On the whole, however, it may be reckoned a dangerous practice to sleep with open windows, whether at night, or in the day-time: yet a very small aperture, without admitting a strong current of air to pass through the room, may occasionally be useful. Nor should the bedstead be placed near a wall; or soiled linen be suffered to remain in an apartment where the purity of the air is of importance. A bed, or couch, ought to stand free on all its sides, and, if possible, in the middle of the chamber.

Among the various materials used for bedsteads, iron is not only the most durable, but also the most beneficial, with respect to health. It is, at least, particularly suitable for hospitals, workhouses, large dormitories for poor children, &c. Mr. *Lambert*, of Berwick-street, Soho, London, has given the following description of a newly-invented *bedstead for the sick and wounded*, which he terms the *Royal Patent Fracture-Bed*, and which is equally well calculated to alleviate the painful situation of the aged, the infirm, or diseased. As it affords a comfortable accommodation to persons confined by fractures, gout, palsy, &c. so it is particularly adapted to lying-in women. In this contrivance, the bed may be made, and the linen changed, without in the slightest manner disturbing the patient, which cannot but render it highly serviceable in camps and hospitals.

We have given a representation of it in plate III. of which the following is an explanation: A, shews the bedstead; B, the feather-bed; C, the straining-frame; D, the fracture-frame; S, S, S, S, four rings in the fracture-frame; E, the sleeping-desk; R, R, two rings in the sleeping-desk; F, F, F, F, pullies put in motion by the machinery; G, G, G, G, receiving-hooks of the fracture-frame; 3 3 3 3, four rings in the straining-frame: H, H, H, H, receiving-hooks to ditto; I, the plate of the machinery; K, the great wheel; L, a pinion, with a winch turning the great wheel; O, a pall or stop; M, a pinion with a fly, to prevent a too sudden descent; N, the rollers.

The subjoined directions should be attended to in making and using the bed. Lay the straining-frame C, covered with ticking, on the feather-bed B, then the under-blanket and sheet: above these, place the fracture-frame D, (on which the patient is supported); then the bolster, pillows and upper-clothes, in the usual manner. When the feather-bed is to be made, wind up the two frames, C, and D, by the winch, till the patient is supported above the bed, which may then be made, or, if necessary, another placed in its stead, and the two frames let down upon it.

In changing the linen, the two frames C, and D, must be wound up till they reach the four hooks, G, G, G, G; secure the hooks in the four rings S, S, S, S, and wrap the sheet you intend to remove, round the upper clothes, to exclude cold; let down the under-frame C; replace the blanket, and put on the clean sheet; draw away the other, and again wind up the frame to the fracture-frame, and unhook it at the four corners. Thus resting on the under frame, the patient safely descends to the comforts of a new-made bed and clean linen.

As in the early stages of consumptive, or asthmatic disorders, it is material to avoid the heat of a feather-bed, particularly if the patient be liable to night-sweats, and if he be able to rise and have the linen changed, the fracture-frame may not be necessary: in this case, the lower frame may be wound a little above the feather-bed. At the top of the frame C, there is a sleeping-desk, E, by which the head and shoulders may be raised at pleasure, by fixing the two hooks at the end of the frame to the two rings R, R, and freeing those at the feet: after which, by the use of the winch, it may be lowered or raised at pleasure. The whole apparatus may be attached to any four-post bedstead by a common carpenter.

Dr. Willich observes, that the prevailing custom of providing the bedsteads of children with *curtains*, is liable to strong and serious objections: 1. Because they prevent a free access of air for the renewal of that mass which has been rendered unfit for respiration; 2. They endanger the lives of infants by candle-light, from which fatal accidents have frequently happened. 3. They are also pernicious receptacles for the finest particles of dust, which are inhaled by the child confined within such curtains, on the least motion of the bedstead: and thence, perhaps, we may date many of their consumptive attacks.

As to that period of the evening or night, when we retire to enjoy the necessary repose, the same writer observes, that it would be difficult, in the present irregular state of society, to lay down any precise rules. Yet, when we consider the subject, with regard to its influence, as well on the health as the moral character of man, it is deserving of the most serious regard. "Much, indeed, depends on the arrangement of the day, and the different pursuits of the individual. Those persons who spend the greater part of their time in useful labour,

care not to lose a hair of it. This Margaret was a very great woman. It is said, that the Lombard women, when they were at war, made themselves beards with the hair of their heads, which they ingeniously arranged on their cheeks, in order that the enemy, deceived by the likeness, might take them for men. It is asserted, after Suidas, that in a similar case the Athenian women did as much.

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With regard to the apartment, or chamber, in which we sleep, he says: "those happy few who, from their respective situations in life, are enabled to choose a spacious and lofty room for breathing in, for the period of, at least, one-third of their existence, may consider themselves peculiarly fortunate." It must, however, be confessed, that little attention is generally paid to this important object, even by such persons as might, in this respect, equally consult their health and convenience.

A bed-chamber ought never to be on a ground-floor, or to have a northern aspect. Although, on account of a cooler air, many prefer this situation in summer, yet it cannot fail to be unwholesome,

as it is most exposed to the influence of a damp atmosphere in the morning, and during the night. Hence it is the universal opinion, that a southern front is more conducive to health; because it receives the warm rays of the sun, particularly in winter, the most trying season for valetudinarians. Small closets and concealed beds are extremely injurious, especially to young people and to invalids. When persons are from necessity obliged to sleep in them, it will be advisable every morning, immediately after rising, to displace all the bed-clothes; and, if the sky be serene, to open the door and windows, in order to purify the stagnant air of so confined a resting place. On the whole, however, it may be reckoned a dangerous practice to sleep with open windows, whether at night, or in the day-time: yet a very small aperture, without admitting a strong current of air to pass through the room, may occasionally be useful. Nor should the bedstead be placed near a wall; or soiled linen be suffered to remain in an apartment where the purity of the air is of importance. A bed, or couch, ought to stand free on all its sides, and, if possible, in the middle of the chamber.

Among the various materials used for bedsteads, iron is not only the most durable, but also the most beneficial, with respect to health. It is, at least, particularly suitable for hospitals, workhouses, large dormitories for poor children, &c. Mr. *Lambert*, of Berwick-street, Soho, London, has given the following description of a newly-invented *bedstead for the sick and wounded*, which he terms the *Royal Patent Fracture-Bed*, and which is equally well calculated to alleviate the painful situation of the aged, the infirm, or diseased. As it affords a comfortable accommodation to persons confined by fractures, gout, palsy, &c. so it is particularly adapted to lying-in women. In this contrivance, the bed may be made, and the linen changed, without in the slightest manner disturbing the patient, which cannot but render it highly serviceable in camps and hospitals.

We have given a representation of it in plate III. of which the following is an explanation: A, shews the bedstead; B, the feather-bed; C, the straining-frame; D, the fracture-frame; S,S,S,S, four rings in the fracture-frame; E, the sleeping-desk; R,R, two rings in the sleeping-desk; F,F,F,F, pullies put in motion by the machinery; G,G,G,G, receiving-hooks of the fracture-frame; 3 3 3 3, four rings in the straining-frame: H,H,H,H, receiving-hooks to ditto; I, the plate of the machinery; K, the great wheel; L, a pinion, with a winch turning the great wheel; O, a pall or stop; M, a pinion with a fly, to prevent a too sudden descent; N, the rollers.

The subjoined directions should be attended to in making and using the bed. Lay the straining-frame C, covered with ticking, on the feather-bed B, then the under-blanket and sheet: above these, place the fracture-frame D, (on which the patient is supported); then the bolster, pillows and upper-clothes, in the usual manner. When the feather-bed is to be made, wind up the two frames, C, and D, by the winch, till the patient is supported above the bed, which may then be made, or, if necessary, another placed in its stead, and the two frames let down upon it.

In changing the linen, the two frames C, and D, must be wound up till they reach the four hooks, G,G,G,G; secure the hooks in the four rings S,S,S,S, and wrap the sheet you intend to remove, round the upper clothes, to exclude cold; let down the under-frame C; replace the blanket, and put on the clean sheet; draw away the other, and again wind up the frame to the fracture-frame, and unhook it at the four corners. Thus resting on the under frame, the patient safely descends to the comforts of a new-made bed and clean linen.

As in the early stages of consumptive, or asthmatic disorders, it is material to avoid the heat of a feather-bed, particularly if the patient be liable to night-sweats, and if he be able to rise and have the linen changed, the fracture-frame may not be necessary: in this case, the lower frame may be wound a little above the feather-bed. At the top of the frame C, there is a sleeping-desk, E, by which the head and shoulders may be raised at pleasure, by fixing the two hooks at the end of the frame to the two rings R,R, and freeing those at the feet: after which, by the use of the winch, it may be lowered or raised at pleasure. The whole apparatus may be attached to any four-post bedstead by a common carpenter.

Dr. Willich observes, that the prevailing custom of providing the bedsteads of children with *curtains*, is liable to strong and serious objections: 1. Because they prevent a free access of air for the renewal of that mass which has been rendered unfit for respiration; 2. They endanger the lives of infants by candle-light, from which fatal accidents have frequently happened. 3. They are also pernicious receptacles for the finest particles of dust, which are inhaled by the child confined within such curtains, on the least motion of the bedstead: and thence, perhaps, we may date many of their consumptive attacks.

As to that period of the evening or night, when we retire to enjoy the necessary repose, the same writer observes, that it would be difficult, in the present irregular state of society, to lay down any precise rules. Yet, when we consider the subject, with regard to its influence, as well on the health as the moral character of man, it is deserving of the most serious regard. "Much, indeed, depends on the arrangement of the day, and the different pursuits of the individual. Those persons who spend the greater part of their time in useful labour,

and have sufficient muscular exercise, would better consult their health, by retiring to repose at least two or three hours before midnight; which, according to the most accurate observers, are nearly as refreshing as double that portion in the morning. Those, however, who lead an idle and luxurious life, are too much the slaves of fashion, habit, and caprice, to adopt any useful changes, which might abridge their amusements or imaginary comforts.

" On the other hand, the studious, and especially speculative persons, cannot comply with what are generally called 'regular hours;' because their pursuits are better adapted to the solemn stillness of night, while they indulge in reflections which require a connected series of thought, and acute reasoning, uninterrupted by the noises of day. Yet, even *literati* and *artists*, ought to pay due attention to this important circumstance, that the atmosphere of the night is always more vitiated, and consequently less fit for respiration, than that of a serene day; and as we respire a greater portion of air while awake, than in a sleeping state, it follows that the system must be more injured in the former than in the latter case.

" Nor would it be proper to retire to rest immediately after a full meal, or in an agitated state of mind. Hence, after a light supper, two hours ought to elapse, in order to prepare ourselves for an invigorating repose, and banish all gloomy or depressing ideas and thoughts which require mental exertion. For the same reason, we should remove from our sight every object which may irritate the nerves, and never adopt that pernicious practice of reading, till we fall asleep—an imprudence of which many young and thoughtless persons are guilty. Instead of such a dangerous expedient, it would be more salutary to walk up and down the room for a few minutes, or to take any other gentle exercise."

Lastly, Dr. Willich gives it as his opinion, that such individuals as breakfast at nine, dine at two, and drink tea at six; or, instead of this, eat a light supper between seven and eight o'clock, might, with the greatest benefit to their health, retire to bed at ten, and rise at five or six o'clock in the morning, or earlier, according to the degree of exercise they have taken on the preceding day. See the articles Diet, Sleep, &c.

BEDSTRAW, LADIES. See Aperina.

BEECH-TREE. See Fagus.

BEER; a spirituous liquor made from any farinaceous grain, but generally from barley. It is, properly speaking, the wine of barley. The meals of any of the grains being extracted by a sufficient quantity of water, and remaining at rest in a degree of heat requisite for the spirituous fermentation, naturally undergo this fermentation, and are changed into a vinous liquor. But as all these render the water mucilaginous, fermentation proceeds slowly and imperfectly in such solutions. On the other hand, if the quantity of farinaceous matter be so diminished that its extract or decoction may have a convenient degree of fluidity, this liquor will be impregnated with so small a quantity of fermentable matter, that the beer or wine of the grain will be too weak, and have too little taste.

These inconveniencies are remedied by preliminary operations which the grain is made to undergo.—These preparations consist in steeping it in cold water, that it may soak and swell to a certain degree; and in laying it in a heap with a suitable degree of heat, by means of which, and of the imbibed moisture, a germination begins, which is then stopped by a quick drying, as soon as the bud shows itself. To accelerate this drying, and to prevent the farther vegetation of the grain which would impair its saccharine qualities, the grain is slightly roasted, by making it pass down an inclined canal sufficiently heated. This germination, and this slight roasting, change considerably the nature of the mucilaginous fermentable matter of the grain. The germination attenuates much, and in some measure totally destroys, the viscosity of the mucilage; and it does this, when not carried too far, without depriving the grain of any of its disposition to ferment. On the contrary, it endows the grain with a saccharine substance, as may be perceived by mashing grains beginning to germinate. The slight roasting contributes also to attenuate the mucilaginous fermentable matter of the grain. When the grain is thus prepared, it is fit to be ground, and to impregnate water with much of its substance without forming a gluey or viscous mass. The grain thus prepared is called *malt*. This malt is then slightly ground; and all its substance, which is fermentable and soluble in water, is fully extricated by means of hot water. This extract or infusion is sufficiently evaporated by boiling in caldrons; and some plant of an agreeable bitterness, such as hops, is at that time added, to heighten the taste of the beer, and to render it capable of being longer preserved. Lastly, this liquor being put into casks, is allowed to ferment, and the chemistry of nature performs the rest of the work.

With respect to the medical properties of beer, and of all malt-liquors, we shall observe, that they are possessed of various degrees of salubrity, according to the proportion and quality of their ingredients, namely, water, malt, and hops, of which they are composed; and likewise, according to the manner in which they have been brewed. If, for instance, a large proportion of water has been used, the beer will be more proper for quenching thirst, than if it were strongly impregnated with the mealy and spirituous particles of the malt. Hence, strong and sweet beer is the most nourishing and beneficial to thin and emaciated persons; stale

and bitter ale, the most intoxicating; and weak, half fermented porter, the most flatulent, and least proper for nervous, debilitated, hysteric, or asthmatic constitutions. But, as there is no peculiar test, by which we can ascertain with critical accuracy, when the vinous fermentation is completed, and the acetous has commenced, every kind of beer must be barrelled, or bottled, before it is perfectly fermented, so that the completion of this natural process takes place in the stomach and bowels. Strange, Dr. Willich says, as this proposition may appear to some persons, it is so true, that the infinite diversity of flavour and briskness obtained from the same mixture, when drawn off into different vessels, or bottles, cannot fail to strike the most superficial observer.

Beer always contains a portion of fixed air, which being disengaged within the alimentary canal, is apt to occasion flatulency and diarrhœa. To the mariner, however, and those who are subject to scorbutic complaints, it is, in general, a wholesome beverage, though we cannot refrain from animadverting upon the prevailing, erroneous notion, that ale or porter *promote* digestion: this is refuted by the uniform evidence of experience, whence it clearly appears that, of all liquids whatever, *pure water* is the most beneficial solvent of animal and vegetable substances. Such individuals, therefore, as make use of nourishing, and principally animal food, require *no* beer for its digestion; as the habitual drinking of malt liquors will expose them to all the inconveniencies of plethora, or a full and gross habit. Others, however, who live chiefly on vegetable diet, and whose stomachs are weak or impaired, may be greatly invigorated by a *moderate* use of *strong* and *bitter* malt-liquors—a purpose which the common table beer cannot answer. Persons of a rigid fibre, and whose bile is duly secreted, Dr. Willich says, ought to drink such beer as is sufficiently strong and nourishing, without being of an intoxicating nature: for this purpose, he would give the preference to sound *beer*, over Burton, and other ales.—A thin, weak, and well-fermented beer, is diluent and wholesome; whence it agrees well with the plethoric, and persons disposed to corpulency. On the contrary, thick and nourishing malt-liquors are most serviceable to the debilitated, and especially to wet-nurses; consequently *sweet* beers are chiefly nutritive, and more proper for daily use, on account of their being least exposed to dangerous adulterations; while the *bitter* kinds, rendered so by *quassia* and other substances less expensive to the brewers than hops, possess medical properties, and should therefore be drunk with reserve.

Lastly, every kind of beer is improper for the hysteric, the hypochondriac, and all those who are already of a full habit; but it is of peculiar service to the laborious, the lean, and emaciated, and will agree in all such constitutions as are not liable to flatulency, or any disease of the viscera.

Sour beer may be completely restored, by adding to it, at the time it is to be drunk, just so much alkali as will neutralize the acid *and no more*. Beer that is become flat or dead, may be restored by impregnating it with fixed air. In either of these cases it is rendered as wholesome as at first.

BEESTINGS, or Breastings, a term used to signify the first milk taken from a cow after calving. The beestings are of a thick consistence, and yellow colour. Medical authors have imagined them peculiarly fitted and intended by nature to cleanse the young animal from the recrements gathered in its stomach and intestines during its long habitation *in utero*. The like quality and virtue is supposed also to reside in women's first milk after delivery; and hence the necessity of the mother's suckling her own child, rather than committing it to a nurse whose first milk is gone.

BEET, RED. See Beta rubra.

BEFA'RIA, a genus in Linnæus's botany. He enumerates two species.

BE'GMA, (βηγμα, from βηξ, *a cough*). Hippocrates used this word, to signify both a *cough*, and the matter brought up with it.

BEGO'NIA, a genus in Linnæus's botany. He enumerates three species, but there are many others.

BE'HEN ALBUM. The root which bears this name in the pharmacopœias, is obtained from the *centaurea behen; calycibus scariosis; foliis radicalibus lyratis, lobis oppositis; caulinis amplexicalibus* Linn. An aromatic odour, a glutinous and gently styptic taste, and a white colour, are its properties. Though still employed in foreign prescription, it is never used in this country.

BE'HEN RU'BRUM. The officinal root so called is of a deep red colour; and obtained from the *statice limonium; scapo paniculato, tereti; foliis lævibus, enerviis, subtus mucronatis* Linn. It possesses astringent and strengthening properties, though not in any very remarkable degree.

BELA'E CORTEX; the bark of a tree growing in Madagascar, called *belae*, or *bela-aye*. It is thin, of a yellowish colour externally, reddish within, and to the taste slightly bitter and astringent. It is said to be very efficacious in the cure of diarrhœas.

BELEMNI'TES, vulgarly called *thunder-bolts* or *thunder-stones*. They are composed of several crusts of stone encircling each other, of a conical form, and various sizes; usually a little hollow, and somewhat transparent, formed of several striæ radiating from the axis to the surface of the stone; and when burned or rubbed against one another, or scraped with a knife, yield an odour like rasped horn. Their size is various, from a quarter of an inch to eight inches; and their colour and shape differ. They are supposed to be originally either a part

of some sea-production; or a stone formed in the cavity of some worm-shell, which being of a tender and brittle nature, has perished, after giving its form to the stone. They are very frequently found in many parts of England; and the common people have a notion, that they are always to be met with after a storm. They are often inclosed in, or adhere to, other stones; and are most frequent amongst gravel, or in clay. They abound in Gloucestershire; and are found near Dedington in Oxfordshire, where they sometimes contain the silver marcasite.

BELEMNOI'DES, (from βελεμνον, a *dart*, and ειδος, *shape*); a name for the processus styloides. It is also a name given to the process at the lower end of the ulna, by old writers.

BELL, in chemistry, a glass vessel placed over some matter in a state of exhalation, either to collect the vapour or gather the flowers. Chemical bells are a sort of receptacles chiefly used in preparing substances by sublimation, for gathering and condensing vapours, &c. Modern chemists, however, have improved on this part of the chemical apparatus.

BELLADO'NNA, (from *bella donna*, a handsome lady; Ital.); so called, because the ladies of Italy use it to take away the too florid colour of their faces; *solanum melanocerasus; solanum lethale;* DEADLY NIGHTSHADE, or *dwale. Atropa belladonna, caule herbaceo, foliis ovatis integris* Linn. Class, *Pentandria.* Order, *Monogynia.* This plant has been long known as a strong poison of the narcotic kind, and the berries have furnished many instances of their fatal effects, particularly upon children that have eaten them, from their tempting appearance and sweetish taste. The leaves were first used externally, to discuss schirrous and cancerous tumors; and, from the good effects attending their use, physicians were induced to employ them internally for the same disorders; and there are a considerable number of well authenticated facts, which prove them to have been very serviceable. See SOLANUM.

BELLI'NI (Laurence), an eminent physician, born at Florence in the year 1643. At twenty years of age, he was chosen professor of philosophy at Pisa, but did not continue long in this office; for he had acquired such a reputation for his skill in anatomy, that the grand duke Ferdinand II. procured him a professorship in that science. After having held his professorship almost thirty years, he accepted of an invitation to Florence, when he was about fifty years of age. Here he practised physic with great success, and became first physician to the grand duke Cosmus III. He wrote several books on anatomy and medicine in Latin.

BE'LLIS MAJOR; called also *bupthalmum majus, leucanthemum vulgare, consolida media,* and *oculus bovis;* the ox-eye daisy. The pharmacopœial name for the plant described by Linnæus *chrysanthemum leucanthemum; foliis amplexicaulibus, oblongis, superne serratis, inferne dentatis.* The flowers and herb were formerly esteemed in asthmatic and phthisical diseases, but they have now deservedly fallen into disuse with us.

BE'LLIS MINOR; the *bellis perennis, scapo nudo* Linn.; called common daisy. It was formerly directed in pharmacopœias by this name. The leaves and flowers are rather acrid, and are said to promote the cure of several species of wounds, yet they are never employed by surgeons in this country.

BE'LLIS PERE'NNIS; the systematic name for the bellis minor of the pharmacopœias.

BELL-METAL; a compound of copper and tin melted together in suitable proportions.

BE'LLON, the same as COLICA PICTONUM; a dissease common in countries where they smelt lead ore. It is attended with languor, intolerable pains and sensations of griping in the belly, and generally costiveness. Beasts, poultry, &c. as well as men, are subject to this disorder; hence a certain space round the smelting-house is called *bellon-ground,* because it is dangerous for an animal to feed upon it.

BELLO'NIA; a genus in Linnæus's botany; He enumerates but one species.

BELU'LCUM, (βελαλκον, from βελος, an *arrow,* or a *dart,* and ελκω, to *draw*); an ancient instrument for extracting darts and arrows.

BELU'TTA TSJAMPACAM; a large tree in Malabar, whose root is given with ginger, for promoting sweat.

BEN NUX, (βαλανος μυρεψικη; βαλανος αιγυπτια; *glans unguentaria; been nux; balanus mirepsica;* BEN NUT, or *oily acorn.* A whitish nut, about the size of a small filberd, of a roundish triangular shape, including a kernel of the same figure, covered with a white skin: the fruit is produced by the *guilandina moringa; inermis, foliis subbinnatis, foliolis inferioribus ternatis* Linn. These nuts were formerly employed in removing obstructions of the primæ viæ. The oil afforded by expressing them, is used by the Italians in several ointments: it is said to be particularly serviceable in allaying the itching of the prurigo senilis.

BE'NATH; the Arabic name for small pustules which rise in the night after sweating.

BENEDI'CTUS, (signifying *blessed*); a term anciently much used for the milder purges, as rhubarb, and other aperient vegetable substances. Since that, it has been applied not only to some officinal compositions of the like natuse, but also to those of different qualities, as the vinum benedictum, which is an emetic, the aqua benedicta, a topical remedy, and some others. With us, however, it is wholly disused.

BENGA'LÆ RADIX. See COSSUMUNIAR.

BENGAL QUINCE; a fruit which is the pro-

duce of the *crateva marmelos*, Linn. It grows spontaneously in several parts of India, is about the size of an orange, and covered with a hard shell, containing a yellow viscous pulp, of a most agreeable flavour. This is scooped out, and, being mixed with sugar and orange, is brought to the tables of the grandees in India, who eat it as a great delicacy. It is esteemed a sovereign remedy against the dysentery.

BENNET, HERB. See CARYOPHYLLATA.

BENJAMIN. See BENZOINUM.

BENJAMIN FLOWERS. See BENZOIC ACID.

BENZOATES; salts formed by the chemical union of the benzoic acid with certain bases; as benzoat of alumine, &c.

BENZOIC ACID. When benzoin is powdered and boiled in water, it affords an acid salt, which crystallizes in long needles by cooling. This salt may also be extracted by sublimation. It rises by a degree of heat even less than that which is required to raise the oil of benzoin; and this is the substance called heretofore FLOWERS OF BENZOIN, or the *sublimed acid of benzoin.*

For preparing these Mr. Chaptal has invented another and more economical method, which is by distilling the benzoin, and causing all the products to pass confounded together into a capacious receiver. He then boils the product in water, and by this means obtains a much greater quantity of the salt of benzoin: because, in this state, the water attacks and dissolves the whole contents; whereas the most accurate trituration will not produce the same effect.

The following are the observations and experiments of Mr. Scheele upon this substance: from ninety-six parts of benzoin he obtained, by sublimation, between nine and ten parts of this sublimated salt, which was very far from what Spielman asserted that he obtained—namely, a fourth part of the benzoin submitted to distillation: it appears that the last chemist had taken acid of benzoin mixed with empyreumatic oil for pure acid. Scheele having reduced benzoin to powder, and mixed it with chalk, boiled upon it a quantity of water, and then filtrated the liquor, which afforded no salt on cooling: sulphuric acid, poured into this liquor, separated the acid of benzoin in powder, and showed that acid to have been united with a base of chalk, with which it formed a neutral salt soluble in water: the quantity of concrete acid, however, precipitated by this process, was not more considerable than that which is obtained by simple lixiviation. He, therefore, thought that a greater quantity might be obtained by employing a matter capable of acting on the resin, and facilitating the separation of the salt. Potass did not serve his purpose; the resin again collected on the surface of the liquor in a thick tenacious oil, on which account he could not expect the acid to be entirely separated. With quicklime he was more successful: according to him, it is to be applied in the following manner: take four ounces of quicklime; slake it with twelve ounces of water; add eight pounds more when the ebullition ceases: mix six ounces of this water with a pound of benzoin in powder; these substances need to be well stirred, in order that they may mix properly; put in by degrees the remaining part of the lime-water: when the lime-water is thus gradually poured in, it hinders the benzoin from collecting into a mass: this liquor must next be heated for half an hour by a moderate fire, and constantly stirred: it is then taken off the fire, and suffered to settle for several hours together; the clarified liquor is now decanted off; eight pounds of tartar are poured upon the residue; it is boiled for half an hour, and then mixed with the clarified liquor before poured off from it: the operation is finished by putting the residue upon a filter, and pouring hot water upon it. These lixivia are next reduced all to two pounds by evaporation; a little resin is separated: when the evaporated liquor is cooled, a quantity of muriatic acid is dropped upon it, till it cease to produce a precipitate, and the liquor takes a discernible acid taste: the salt of benzoin is then precipitated in powder. It is to be edulcorated on the filter; when it is wanted in crystals, it is dissolved in five or six times its weight of boiling water; it is then filtrated through a cloth, and the solution slowly cooled; the salt is deposited in oblong compressed prisms. In this process the lime absorbs the acid of benzoin, and forms with it calcareous benzoate, which is very soluble; and the resin is separated from that salt, which has but very little affinity with it. The muriatic acid, which attracts lime with more force than the acid of benzoin, seizes that earth, and separates the vegetable acid. The liquor, when reduced to two pounds by evaporation, is no longer sufficient to maintain the acid in solution, and it is, therefore, almost all deposited. Calcareous benzoate has not the smell of benzoin, but as soon as the benzoin is separated by the muriatic acid, it takes that lively smell which is peculiar to this balsamic substance. By this process Scheele obtained twelve or fourteen drachms of acid of benzoin from the pound of benzoin; whereas sublimation affords only nine or ten. The above chemist observes further, that the purification of this salt by hot water and by crystallization, causes a great quantity of it to be lost: that this salt, when properly crystallized, is very difficult to be reduced to powder; and that, by the purification, only about two grains of resin are separated from a pound of benzoin. The filtration of this acid when dissolved in water, can only be effected through a linen cloth; for the salt being separated quickly, as the liquor cools, it stops up the pores of paper.

Since these experiments were made known, Mr. Lichtenstein has published some observations on the acid of benzoin; in which he asserts, that sublimation affords more of this acid than the process by lime-water; but Mr. Fourcroy agrees with Scheele and Morveau, in thinking that this can only be understood of the purified acid. This acid in a state of purity has a taste somewhat sour, pungent, hot, and acrid; but its smell is only a little aromatic; it communicates a high red colour to the tincture of turnsole, and effervesces with the alkaline carbonates.

Air does not seem to have any power of acting on this acid; for, after being preserved twenty years in a glass vessel, a quantity of it was still very pure, and had lost nothing of its weight: it loses its smell indeed; but that it regains by heat. The acid of benzoin is scarce soluble in cold water; from the experiments of Wenzel and Lichtenstein it seems that 480 grains of cold water dissolve no more than one grain of this acid; but the same quantity of boiling water dissolves twenty grains of it; nineteen of which are separated by cooling. Bergman has, however, asserted that boiling water dissolves $\frac{1}{24}$ of its own weight, and that water of a moderate temperature dissolves nearly $\frac{1}{500}$ part. Alkohol dissolves benzoin totally without leaving any residue but such foreign impurities as the balsam may happen to contain.

The acid of benzoin combines with all earthy and alkaline bases, forming with them benzoates of alumine, barytes, magnesia, lime, pot-ash, soda, and ammoniac; but neither the particular characteristic properties of these various combinations, nor the different affinities of the acid with each of these bases, are known. It has been asserted by Mr. Lichtenstein, that it prefers the fixed alkalis, and even ammoniac, to alumine, magnesia, or lime; but Bergman observes, that lime separates the alkaline bases, and barytes separates lime; and that this acid disengages the carbonic acid from all these bases. The concentrated sulphuric acid dissolves it easily without either noise or heat, according to the same chemist; but passes in consequence of effecting this solution into the state of sulphureous acid. The acid of benzoin may be separated from it unaltered, by water. The nitric acid likewise dissolves it, and gives it up in the same manner to water without alteration. M. de Morveau has caused these two bodies to re-act on each other with additional force by the application of heat. The nitrous gas was not disengaged till the end of the operation; and the acid of benzoin was separated without loss, and without alteration.

The benzoic acid is not exclusively obtained from benzoin; since chemists have found it to exist in the other balsams, such as tolu, storax, and balsam of Peru.

BENZO'INUM, *(benzoah*, Arab.), also called *benzoe, benjoinum, assa dulcis;* GUM BENJAMIN. This substance is classed, by modern chemists, among the balsams. There are two kinds of it: viz. *benzoe amygdaloides*, which is formed of white tears, resembling almonds, united together by a brown matter; and *common benzoin*, which is brown and without tears. The tree which affords this balsam is the *styrax benzoin*, according to the London Philosophical Transactions *(styrax foliis oblongis acuminatis, subtus tomentosis, racemis compositis longitudine foliorum.* Dryander. Class, *Decandria.* Order, *Monogynia)*, from which it is obtained by incisions. The benzoin of the shops is usually in very large brittle pieces. When chewed, it imparts very little taste, except that it impresses on the palate a slight sweetness. Its smell, especially when rubbed or heated, is extremely fragrant and agreeable.

This balsam, in its properties, differs little from storax, only in containing a larger proportion of benzoic acid. Neumann found that it was totally soluble in alkohol, forming a blood-red tincture, and that water extracted no gummy matter, but a notable proportion of benzoic acid. By sublimation he got two ounces of impure acid from sixteen of benzoin. Lime and the alkaline carbonates dissolve the acid without attacking the resin, and are accordingly employed in the processes of Scheele, Gœttling, and Gren, for obtaining the benzoic acid. Dr. Duncan found that the solution of potass dissolved benzoin very rapidly, forming a dark coloured solution mixed with fine crystals of benzoate of potass. This alkaline solution, he says, is not decomposed by water, but forms with acids a rose-coloured coagulum, easily soluble in excess of acid. Boiling nitrous acid also attacks benzoin with great violence, the solution becomes turbid, and lets fall a copious precipitate on cooling. It is also decomposed by water, and by alkaline solutions.

Benzoin has rarely been used medicinally in a simple state, but its preparations are much esteemed as remedies for inveterate coughs and phthisical complaints. The acid of benzoin, formerly named the *flowers*, is employed in the *tinctura opii camphorata*, and a tincture is directed to be made of the balsam, viz.

Tinctura Benzoes Composita. Edin.

Take of Benzoin, three ounces;
Balsam of Tolu, one ounce;
Socotorine aloes, half an ounce;
Rectified spirit of wine, two pints.

Digest with a gentle heat for a week and strain. If exposed to the sun, and occasionally shaken, the solution of the gums will soon take place.

The London college add two ounces of storax, and use socotorine aloes in place of the hepatic.

These differences are not very material; and both preparations may be considered as elegant simplifications of some very complicated compositions, which were celebrated under different names; such as Baume de Commandeur, Wade's balsam, Friar's balsam, Jesuit's drops, &c. These, in general, consisted of a farrago of discordant substances. They, however, derived considerable activity from the benzoin and aloes; and every thing to be expected from them may be obtained from either of the above formulæ.

BE'RBERIS, (from *berberi*, Arab.) the BARBERRY, or *pipperidge bush;* a genus of the monogynia order, belonging to the hexandria class of plants; the characters of which are: the calyx consists of six leaves; the petals are six, with two glands at the ungues; it has no stylus; and the berry contains two seeds.

The species are, 1. The *vulgaris*, or common barberry, *berberis vulgaris; pedunculis racemosis; spinis triplicibus* Linn. grows naturally in hedges in many parts of England, as also in some parts of Scotland; but is also cultivated in gardens on account of its fruit, which is pickled and used for garnishing dishes. It rises to the height of eight or ten feet, with many stalks, which have a white bark, yellow on the inside. The stalks and branches are armed with sharp thorns, which commonly grow by threes; the leaves are oval, obtuse, and slightly sawed on their edges. The flowers come out from the wings of the leaves in small ramose bunches, like those of the currant bush, and are of a yellow colour; these are succeeded by oval fruit, which are at first green, but when ripe turn to a fine red colour. The flowers appear in May, and the fruit ripens in September. There are two or three varieties of this shrub, which by some have been taken for distinct species; one is the barberry without stone; another, the barberry with white fruit; and a third is called by Tournefort the *taller eastern barberry*, with a black sweet fruit. Of these Mr. Miller observes, that the first certainly depends on the age of the plant; because the suckers taken from those bushes commonly produce fruit with stones: the second, he says, seldom bears any fruit; the leaves are of a lighter green colour, and the bark of the stalks is whiter than those of the common kind: the third appears to be the same with the common sort, excepting the colour and flavour of its fruit, which can never indicate a specific difference. 2. The *canadensis*, is a native of that country from whence it takes its name, and was formerly much more common in British gardens than at present. The leaves are much broader and shorter than those of the common sort, and the fruit is black when ripe. 3. The *cretica*, with a single flower in each footstalk, is at present very rare in Britain. It sends out many stalks from the root, which are strongly armed with spines at every joint: the leaves are produced without order, and are shaped like those of the narrow-leaved box-tree; the flowers come out from between the leaves, each having a slender footstalk; but they are not succeeded by fruit in Britain.

The medicinal qualities of the barberry are these: the berries, which are so acid that birds will not feed upon them, are astringent; and have been given occasionally in diarrhœas. Among the Egyptians, barberries are used in fluxes and in malignant fevers, for abating heat, quenching thirst, raising the strength, and preventing putrefaction. The fruit is macerated for a day and a night, in about twelve times its quantity of water, with the addition of a little fennel seed to reconcile it to the stomach; the liquor strained off, and sweetened with sugar or syrup of citrons, is given the patient liberally to drink. Prosper Alpinus, from whose treatise, *De Medicina Ægyptorum*, Dr. Lewis extracted this account, informs us, that he took this medicine himself with success, in a pestilential fever accompanied with an immoderate bilious diarrhœa. The leaves also are gratefully acid. The flowers are offensive to the smell when near, but at a distance their odour is extremely fine. An infusion of the bark in white-wine is purgative. The roots boiled in ley, dye wool of a yellow colour. In Poland they dye leather of a most beautiful yellow with the bark of the root. The inner bark of the stems will dye linen of a fine yellow, with the assistance of alum.

BE'RBERIS VULGA'RIS; the systematic name for the *berberis* of the pharmacopœias. See BERBERIS.

BERENI'CIUM, (*βερενικιον*); a species of nitre mentioned by Galen.

BERGAMOT, or BERGAMOTTE, *essentia de cedra;* a species of citron, produced at first casually by an Italian grafting a citron on the stock of a bergamot pear tree; whence the fruit produced by this union, participated both of the citron tree and the pear tree. The essence prepared from this fruit is called essence of bergamot.

BE'RG-GRU'IN, the name of a species of earth used as a pigment, and more properly called *green-ochre*. It is found in many parts of Germany, Italy, and England, commonly in the neighbourhood of copper-mines, from particles of which metal it receives its colour. In many parts of Germany, they have a purer kind of this, distinguished by no peculiar name, but separated by art from the waters draining from the copper-mines, and differing no otherwise from this native substance, than as the washed ochres of Oxfordshire, &c. do from those sent us in their natural condition. The characters by which the native kind is known from other green earths, are these: it is a dense compact substance, considerably heavy, and of a pale but not disagreeable green; of a rough and uneven, but not dusty surface, and somewhat unctuous to

the touch. It adheres firmly to the tongue; does not break easily between the fingers; nor at all stains the hands. It is of a brackish disagreeable taste, and does not ferment when mixed with acids.

BERIBE'RI, or BERIBERIA, a disease of a very peculiar nature, which occurs in the East Indies. These terms mean, in the common language of that country, *sheep;* but in a medical sense, a species of palsy, wherein, according to Bontius, patients seem to imitate sheep in lifting their legs when they walk. He says this palsy is a kind of trembling, in which there is a deprivation of the motion and sensation of the hands and feet, and sometimes of the body. Sauvages defines it, under the order of *clonic spasms*,—" in walking, a retraction of the knee, with tremor; a sense of crawling, or tingling, and hoarseness, common in the Indies." By Linnæus, it is defined, " a tremor of the parts, contraction of the knees, i. e. continual chronic agitation of the parts, with a sensation of coldness, stupor, and hoarseness." Sagar adds to the definition of Sauvages, " a painful stupor of the limbs," and says, he " once saw some sheep, observing a wolf, seized with this spasmodic affection; and that they, whether standing still or walking, momentaneously retracted their knees, which immediately returned to their natural situation." Dr. Aitkin makes it synonymous with the contraction. The cause is generally thought to be exposure to the cold vapours of the night too soon after exercise. In this case swelling affects the joints, and relaxes their ligaments. Generally its approach is gradual; but sometimes it seizes the patient suddenly. The symptoms are a universal lassitude, a motion, such as has been described, of the hands and feet, and the same throbbing titillation is felt in them as is felt in the fingers and toes in a cold country in the winter season, only the pain is not so great. Sometimes the voice is so obstructed as to render articulation difficult. Other symptoms occasionally attend the patient, but these are the chief. This disease is not often mortal, except by seizing the muscles of the breast, so as to obstruct respiration. For the cure, moderate exercise and frictions are used by the Indians. A half-bath is made of water, in which is boiled an aromatic kind of herb called *lagondi*, or, in want of it, camomile and melilot. The affected parts are rubbed well with a mixture of the oils of mace and roses. Bleeding is not required; but, on the contrary, warm nervous restoratives are used; and now and then, a gentle purge. Decoctions of sarsaparilla and guaiacum are also of service, according to Bontius.

BERMUDAS BERRY. See SAPONARIÆ NUCULÆ.

BERRIO'NIS, a name for colophony, gum juniper, or vernice.

BE'RYL, a substance called by lapidaries *aqua marina.* It is a pellucid gem of a blueish green colour, found in the East Indies and about the gold mines of Peru: we have also some from Silesia, but what are brought from thence are oftener coloured crystals than real beryls; and when they are genuine, they are greatly inferior both in hardness and lustre to the oriental and Peruvian kinds of beryl. The beryl is to be met with both in the pebble and columnar form, but in the latter most frequently. In the pebble form it usually appears of a roundish but flatted figure, and commonly full of small flat faces, irregularly disposed. In the columnar or crystalline form it always consists of hexangular columns, terminated by hexangular pyramids. It never receives any admixture of colour, nor loses the blue and green, but has its genuine tinge in the degrees from a very deep and dusky to the palest imaginable of the hue of sea-water. In its perfect state the beryl approaches to the hardness of the garnet, but is often softer; and its size is from that of a small tare to that of a pearl, a horse bean, or even a walnut. The properties of the beryl were very wonderful in the opinion of the ancient naturalists; it kept people from falling into ambuscades of enemies, excited courage in the fearful, and cured diseases of the eyes and stomach.

BESLE'RIA, in botany, (from *Basilius Besler*, an apothecary at Nuremberg, author of a book, intitled, *Hortus Eystetensis)*, a genus of the angiospermia order, belonging to the didynamia class of plants. Of this genus there are three species; the melittifolia, with branching footstalks and oval leaves; the lutea, with single footstalks growing in clusters, and spear-shaped leaves; and the cristata, with stalks growing single, and a five leaved involucrum. All these are natives of the warm parts of America.

BESSA'NEN, a word used by Avicenna. It is a redness of the external parts, resembling that which precedes the leprosy. It occupies the face and extremities. Dr. James thinks it is what we call chilblains.

BE'TA, (from the river *Bætis* in Spain, where it grows naturally; or from the Greek letter *β*, which, when turgid with seed, it is said to resemble); BEET. It is a plant with large, smooth, broad-ribbed, juicy leaves, and slender, striated, branched stalks, bearing spikes of imperfect flowers, followed each by a roundish, rough, watery seed-vessel. Different sorts are cultivated for culinary uses: Linnæus supposes them to be varieties of the wild *beet* which grows on some of the sea-coasts of England, Holland, &c. They are all biennial. That named alba, called also *sicula*, is the *cicla beta pallascens*, or *common white beet.* The *beta rubra vulgaris*, called also *beta nigra*, is the *turnip-rooted red beet*, and *red Roman-beet*, or

beetrave. It is the *beta vulgaris floribus congestis* Linn. There is a wild sort which Dioscorides calls *limonium.*

The roots of the *beet* used as food, are difficult of digestion, and afford but little nourishment. If freely eaten they are laxative and emollient. They give out their virtue to water by boiling. The red sort give out their colour to spirit of wine; and on expression, their colour accompanies their juice.

The juice of both kinds has been considered as a powerful errhine, occasioning a copious discharge, without sneezing; but Dr. Cullen says, in the trials he made, the juice snuffed up the nose gave no large or durable evacuation. The dried red beet roots yield one twentieth part their weight of sugar, and the dried white beet roots one tenth. None of the species are now employed in medicine, though they have a place in some of our dispensatories, in which the decoction of the red sort is described to have gently laxative qualities.

BE'TEL, or Betle, an Italian plant, a species of *Piper.* See Betla.

BE'TLA, an Indian plant called also BETEL, or BEETLE; *piper longum foliorum nervis decurrentibus tenuioribus et mollioribus.* It is a scandent plant, growing in different parts of the East Indies. It bears a fruit which resembles a lizard's tail: its taste is agreeable, and in the Malacca isles is called *sirii boa.* The ancient botanists confound its leaf with the MALABATHRUM. Mixed with other things, as fancy directs, the Indians chew it almost continually, as Europeans do tobacco. It is gratefully cordial, but is said to injure the teeth.

BETO'NICA, (corrupted from *vetonica,* which is derived from the *Vetones,* an ancient people of Spain), the *betonica purpurea, vetonica cordi,* or WOOD BETONY. It is the *betonica officinalis; scica interupta, corollarum labii lacinia intermedia emarginata* Linn. and common in our woods and heaths. The leaves and tops have an agreeable but weak smell; and to the taste they discover a slight warmth, accompanied with some degree of astringency and bitterness. The powder of the leaves of betony snuffed up the nose provokes sneezing; and hence it is sometimes made an ingredient in sternutatory powders. This effect does not seem to be owing, as is generally supposed, to any peculiar stimulating virtues in the herb, but to the rough hairs with which the leaves are covered. The roots of this plant differ greatly in their quality from the other parts: their taste is very bitter and nauseous; taken in a small dose, they vomit and purge violently, and are supposed to have somewhat in common with the roots of hellebore. According to Simon Pauli and Bartholinus, this plant affects those who gather any considerable quantity of it, with a disorder resembling drunkenness. Its leaves are sometimes smoked like tobacco, probably on this account. Betony has been, like many other plants, formerly in high medical estimation, but it is now almost entirely neglected. Antonius Musa, physician to the Emperor Augustus, filled a whole volume with enumerating its virtues, stating it as a remedy for no less than forty-seven disorders; and hence, in Italy, the proverbial compliment, *you have more virtues than betony.*

BE'TULA, the birch-tree. A genus in Linnæus's botany. To this genus he adds the *alnus,* or alder-tree, and enumerates seven species.

BEXAGUILLO, the Peruvian ipecacuanha.

BE'ZOAR, from pa-zahar, Persian, which signifies an *antidote.* Avenzoar is the first who mentions it as a medicine, or who gives its history, with many fanciful and even ludicrous conjectures as to its origin. Bezoar stones are preternatural or morbid concretions formed in the bodies of several land animals; they are composed of several strata, or layers, like an onion. In the Hist. de l'Acad. an. 1703, it is asserted that all *bezoar* stones are bilious concretions of the respective animals which afford them.

Bezoars may be ranked thus: 1. The true oriental and occidental. 2. Such stones as are got from animals, and resemble *bezoar;* such as those from apes, and even the various species of pearls and crab's eyes. 3. The several species of fossile *bezoars.* 4. Those that have only the shape, without the properties of *bezoar,* such as the human calculi in the bladder, kidneys, and gall-bladder; or in the same parts of oxen. Besides these, there are the ægragropila, and *bezoar Germanicum,* produced from the *capra alpina.*

The *oriental bezoar* is supposed to be produced in the cavity at the bottom of the fourth stomach of a species of goat in Persia called *paura.* It is only found in the old ones, and only in those which feed on particular mountains. This stone finely powdered, and levigated with spirit of wine, was formerly made into balls, which were called *Gascoign-balls,* from the name of their inventor. These were long sold by the trading chemists; or rather a sophisticated medicine without any *bezoar* included in the composition.

Other species of bezoar are the *occidentalis, hystricis, fossilis,* &c. Also the *bezoar simiæ,* or *lapis simiæ,* the bezoar of the monkey. Stones of this kind are found in the stomachs of certain monkeys in Brazil, and the East Indies, but which very rarely produce them. They are about the size of hazel-nuts, harder than the oriental *bezoar,* of a dark green colour, almost black. Notwithstanding their boasted virtues, it is certain that they are absolutely indigestible in the stomachs of the animals in which they are found; and they are equally so in the human, except when accompanied with an acid; so that no more can be expected from these concretes than from any of the testacea that are so-

luble in acids: in fact they are inferior to them, being far less absorbent, and more difficultly acted on by any acid of either the animal or vegetable kinds.

BEZOAR, FOSSIL, a kind of figured stone, formed, like the animal bezoar, of several coats or strata ranged round some extraneous body which forms a nucleus, and supposed to have the same virtues. It is found chiefly in Sicily, in sand and clay pits. It is of a purple colour, with a rough surface, the size of a walnut, and light. When broken, it is found to be an irony crust, containing in its hollow a fine greenish white earth, resembling pale bezoar. The earth is the part preferred, and not the shell. It seems to be of the nature of bole armeniac. It is also called *Sicilian earth.*

BICAUDA'LIS MUSCULUS. Bidloo gives this name to the muscle of the ear, which others call *triceps auris.*

BI'CEPS, (from *bis*, twice, and *caput*, a head). Many muscles have this denomination from their having two distinct heads or origins.

BI'CEPS. See BICEPS FLEXOR CRURIS.

BI'CEPS BRA'CHII. See BICEPS FLEXOR CUBITI.

BI'CEPS CRU'RIS. See BICEPS FLEXOR CRURIS.

BI'CEPS EXTE'RNUS. See TRICEPS EXTENSOR CUBITI.

BI'CEPS FLE'XOR CRU'RIS, the *biceps cruris* of Albinus, and *biceps* of Winslow and Douglas; a muscle of the leg, situated on the hinder part of the thigh. It arises by two distinct heads; the first, called *longus*, arises, in common with the semitendinosus, from the upper and posterior part of the tuberosity of the os ischium. The second, called *brevis*, arises from the linea aspera, a little below the termination of the glutæus maximus, by a fleshy acute beginning, which soon grows broader as it descends to join with the first head, a little above the external condyle of the os femoris. It is inserted by a strong tendon into the upper part of the head of the fibula. Its use is to bend the leg. This muscle forms what is called the outer hamstring; and, between it and the inner, the nervus popliteus, with the arteria and vena poplitea, are situated.

BI'CEPS FLE'XOR CU'BITI, the *biceps brachii* of Albinus, *coraco-radialis*, *seu biceps* of Winslow, and *biceps internus* of Douglas; a muscle of the fore-arm, situated on the fore part of the *os humeri.* It arises by two heads. The first and outermost, called *longus*, begins tendinous from the upper edge of the glenoid cavity of the scapula, passes over the head of the os humeri within the joint, and, in its descent without the joint, is enclosed in a groove near the head of the os humeri, by a membranous ligament that proceeds from the capsular ligament and adjacent tendons. The second or innermost head, called *brevis*, arises, tendinous and fleshy, from the coracoid process of the scapula, in common with the coraco-brachialis muscle. A little below the middle of the forepart of the os humeri, these heads unite. It is inserted by a strong roundish tendon into the tubercle on the upper end of the radius internally. Its use is to turn the hand supine, and to bend the fore-arm. At the bending of the elbow, where it begins to grow tendinous, it sends off an aponeurosis, which covers all the muscles on the inside of the fore-arm, and joins with another tendinous membrane, which is sent off from the triceps extensor cubiti, and covers all the muscles on the outside of the fore-arm, and a number of the fibres, from opposite sides, decussate each other. It serves to strengthen the muscles, by keeping them from swelling too much outwardly, when in action, and a number of their fleshy fibres take their orign from it.

BI'CEPS INTE'RNUS. See BICEPS FLEXOR CUBITI.

BI'CHOS, a Portuguese name for the worms which get under the toes of the people in the Indies. These are destroyed by the oil of the cashew-nut.

BICO'RNES, (from *bis*, *double*, and *cornu*, *horned*). A muscle is so called when it has two terminations. It is also a name of the *flexor carpi radialis*, and of the *extensor carpi radialis.*

BICO'RNES, the name of the forty-fourth class or natural order, in Gerard's arrangement of the plants that are natives of Provence in France. It consists, like the same order in Linnæus, of plants whose antheræ have the appearance of two horns. The genera described by Gerard are, *vaccinium*, *erica*, *azalea*, *rhododendron*, *arbutus*, *styrax*, *pyrola*, and *hedera*, ivy. The last mentioned genus, though its antheræ are bifid at the base, does not belong to Linnæus's class *Bicornes;* but is placed with the vine, and some other genera of plants, in the order *hederaceæ.* See HEDERACEÆ.

BICU'SPIDES, (from *bis*, *twice*, and *cuspis*, *a point*). Double pointed. See MOLARES.

BI'DENS, the plant called WATER-HEMP AGRIMONY. It is a genus of the polygamia æqualis order, belonging to the syngenesia class of plants; and in the natural method ranking under the 49th order, *compositæ-oppositifoliæ.* The receptacle is paleaceous; the pappus has erect scabrous awns; and the calyx is imbricated. Of this genus Linnæus enumerates thirteen species; but none of them appear to merit notice except the tripartita, frequently found by the sides of rivulets, ditches, and lakes, both in Scotland and England. This grows to the height of two feet; and has its leaves divided into three, or often five, lanceolate serrated lobes, with yellow flowers, which are succeeded by flattish angular seeds, having two beards arising from the angles, which are hooked or barbed downwards; and generally they have another shorter beard arising from the middle of the back of the seed. "As this

plant (says the author of the Flora Scotica) is found by a chemical analysis to possess much the same qualities as the celebrated *verbesina acmela*, a plant belonging to a genus very nearly related to this, it is probable it would have the same good effects in expelling the stone and gravel." A decoction of this plant with alum dyes yarn of a yellow colour. The seeds have been known sometimes to destroy the *cyprinus auratus* or gold-fish, by adhering to their gills and jaws.

BIDLOO (Godfrey), an eminent anatomist, author of several treatises on that subject, was born at Amsterdam, in 1649. In 1688 he was professor of anatomy at the Hague; and in 1694, at Leyden; when king William III. of England appointed him his physician; which he would not accept but on condition of holding his professorship, and this was readily granted him. He published in Latin, 1. The Anatomy of the Human Body, demonstrated in 105 plates, explained by the discoveries of ancient and modern writers. This work he accused Cowper of having stolen and published as his own in England. 2. An Oration upon the Antiquity of Anatomy. 3. A Letter to Anthony Liewenhoeck on the animals sometimes found in the livers of sheep and other brutes. 4. Two Decades of Dissertations in Anatomy and Chirurgery; and other pieces. He died at Leyden in 1713.

BIENNIA'LIS, (from *bis*, twice, and *annus*, a year), biennial. Plants are said to be *biennial* when their roots continue two years.

BIFA'RIUS, (from *bis*, twice, and *fari*, to speak), in botany, a term used for leaves which point two ways.

BI'FERÆ, (from *bis*, twice, and *fero*, to bear), in botany, a term applied to plants that flower twice in a year, viz. in spring and autumn; as is common between the tropics.

BI'FIDUS, (from *bis*, twice, and *findo*, to cleave). Bifid, cloven or divided into two parts; called also *dicrœus*.

BIFLO'RUS PEDU'NCULUS, (from *bis*, twice, and *flos*, a flower); bearing two flowers; producing two fructifications on each peduncle or stalk.

BIFO'LIUM, (from *bis*, *twice*, and *folium*, *a leaf)*; so called because it sends up two leaves upon one stalk; also called *ophris*, and *orchis bifolia;* ordinary wood bifoil, and common tway-blade. The root of this plant is slender, but much branched. It sends up one stalk with two leaves from its sides, that are large, oval, and full of nerves. The flowers grow on spikes at the top: they are roundish, and of a dull green colour. It is found in woods and other shady places, and flowers in June. It is ranked among the astringents, but its properties are not considerable.

BIFO'RA PERICA'RPIA, (from *bis*, twice, and *fores*, a door), in botany, the name of a class in Camellus's method. It consists of plants whose *pericarpium* or seed-vessel, is furnished with two inclosures, termed *valvules*. See Valvula. This is exemplified in *chelidonium*, or celandine.

BIFURCATED, *(bifurcus;* from *bis*, twice, and *furca*, a fork). A blood vessel, or nerve, is said to *bifurcate* when it divides into two branches; as in the bifurcation of the aorta, &c.

BIGA'STER, (from *bis*, twice, and γαστηρ, belly); a name given severally to those muscles that have two bellies.

BIGE'MINUS, (from *bis*, twice, and *geminus*, double). In botany a stalk is so called, which is divided, and bears two leaves upon each division.

BIGNO'NIA, trumpet-flower. A genus in Linnæus's botany. He enumerates twenty-one species.

BILIA'RIA ARTERIA, the biliary artery. When the hepatic artery has advanced as far as the vesicula fellis, it gives out the *biliaria*, which accompanies the two cystic branches in the gall-bladder, and, then is lost in the great lobe of the liver. See Bilis.

BILIARY DUCT, ductus biliosus. The very vascular *gloremuli*, which compose almost the whole substance of the liver, terminate in very small canals, called *biliary ducts*, which at length form one trunk, the *ductus hepaticus*. Their use is to convey the bile, secreted by the liver, into the hepatic duct. See Bilis.

BILI'MBI, (Indian), a tree of about eight or ten feet high, which Bontius calls billing-bing; but by the Europeans it is named *malus Indica, fructu pentagono*. It is cultivated in gardens in Malabar, and bears flowers and fruit all the year. The juice of the root is cooling. Expressed from the fruit it cures the itch, and several other cutaneous diseases, if applied by laying on linen cloths that have been dipped in it. Inwardly taken, it abates the colic and diarrhœa. The ripe fruit is eaten as a delicacy, the unripe made into a pickle for the use of the table.

There is another species called *nebi-pouli*, or *bilimbi* altera minor. The male species of the *nebi-pouli* is called *alapouli*, according to Ray.

BI'LIS, bile; a bitter fluid, secreted in the glandular substance of the liver; in part flowing into the intestines, and in part regurgitating into the gall bladder. Healthy bile is of a yellow, green colour; of a plastic consistence, like thin oil, and when very much agitated, it froths like soap and water: its smell is fatuous, somewhat like musk, especially the putrefying or evaporated bile of animals.

The constituent principles of bile are: 1. *Water*, which constitutes the greatest part of bile. 2. *An albuminous principle*, precipitated by alkohol and mineral acids. 3. *A resinous principle*, obtained by evaporating a tincture made of alkohol and bile. 4. *A colouring principle*, which adheres to the resinous part, and gives the colour to bile.

5. *Soda*, in its caustic state: hence healthy bile does not effervesce with acids, and affords a neutral salt. 6. *A phosphorated calx.* To shew the manner in which this important secretion is produced, it is necessary to advert to some points respecting the structure of the liver. This being the largest of all the viscera of the human body (see LIVER), fills up a very large part of the abdomen in its upper chamber, above the mesocolon; and it is still larger, in proportion, in the foetus. It is surrounded on all sides by the neighbouring viscera, and fixed by ligaments in such a manner as to be suspended in the body, with a considerable degree of firmness; yet so as to be allowed a considerable liberty to move and be variously agitated, by the actions of the diaphragm.

This viscus is supplied with vessels of various kinds. Besides the arteries, it has the vena portarum, which receives all the blood of the stomach, intestines, mesentery, spleen, omentum, and pancreas, by two trunks; viz. the transverse splenic and ascending mesenteric; and afterwards by one which is continued with the mesenteries. This is large, composed of strong membranes, and surrounded with much dense short cellular substance, derived to it from the mesentery and spleen, and adding strength to its membranes, which are stronger than those of the aorta. Many of the smaller vessels and hepatic nerves, which all come together under the denomination of a *capsula*, are intermixed with this cellular substance. By this the vena portarum is conducted to the liver, and firmly sustained; insomuch that the branches, being cut, do not collapse, but preserve their round appearance. Each branch of this vessel is divided into many others, again divided and subdivided, like the arteries, till they at length produce the smallest capillaries. In this course every branch of the vena portarum is accompanied with a concomitant branch of the hepatic artery, creeping upon the surface of the vein, and upon the contiguous hepatic ducts, almost in the same manner as the bronchial arteries usually creep along the ramifications of the trachea in the lungs: while, in the mean time, both the artery and the vein are connected to the branches of the biliary ducts by a thin cellular substance like a spider's web. Some branches go out of the liver, being divided to the ligaments, and inosculating with the surrounding veins. And the sum of the branches in the vena portarum is always greater than the trunk; whence the area of the sections of all the branches together greatly exceeds that of the trunk; from whence follow a great friction and resistence, in the same manner as these exist in the arteries.

The blood brought by the vena portarum and hepatic artery must of course be conveyed back again from the liver by some other veins; and therefore the extreme branches of the vena portarum and hepatic artery inosculate ultimately into other veins, which are *branches of the vena cava.* These branches arise from the whole circumference of the liver, run together towards its posterior gibbous part into branches and trunks, and at last go off into ten or more large vessels. The greater number of these lesser trunks pass out through the posterior lobule of the liver, and go to the cava through the sulcus that lies on the right side of the lobule, often completed into a circle by a sort of bridge or production of the liver; from whence they ascend together through the diaphragm towards the left side. Two or three trunks, much larger than the former, are inserted into the cava, close to the diaphragm, whose veins they often take in by the way. The branches of the vena cava are, in the adult, generally fewer and less than those of the vena portarum; which is an argument that the blood moves quicker, because of the less friction, and of the collection of the blood into a less capacity, by which it is always accelerated when there is a sufficient compressing force. As to any valves at the openings of these branches into the cava, there are none which deserve to be regarded. The trunk of the vena cava passes through the foramen of the diaphragm, obtusely quadrangular, and surrounded and terminated by mere tendons, so as to be not easily changeable. Having surmounted this opening of the diaphragm, it then immediately expands into the right auricle. The smaller veins of the liver, creeping about its surface, are sent into the phrenics, renals, and azygos; or, at least, Mr. Fyffe asserts, there is certainly a communication between these and the hepatic veins coming from the portæ.

That the blood comes from all parts by the vena portarum to the portæ, is proved by a ligature, by which any vein between these parts and the ligature swells; but the porta itself, above the ligature, grows flaccid and empty. That it afterwards goes through the liver to the cava, appears by anatomical injections, which shew open and free anastamoses or communications between the vena portarum and the cava; and by the common nature of the veins going to the cava. Again the difficult passage through the vena portarum, like to that of an artery, together with its remoteness from the heart, and the oily or sluggish nature of the blood itself, occasion the blood to stagnate, accumulate, and form scirrhous swellings in no part oftener than in the liver. This danger, however, is diminished by the motion of the adjacent muscles, and by respiration; but it is increased by inactivity, and by sour and viscid aliments. Hitherto, we have been speaking of the adult liver, in which both the umbilical vein and the ductus venosus are empty and closed up, although they continue to cohere with the left branch of the vena portarum.

Quite through the substance of the liver bundles of biliary vessels, of branches of the vena portarum, and of the hepatic artery take their course. Each vessel has its proper cellular texture surround-

ing it, and ligaments, by which it is tied to its fellow vessels; and, lastly, the whole bundle has its cellular texture round it. The branches of the vena cava lie on the outside of the rest, being less accurately received into the same bundle. The ultimate small branches of the vena portarum, cava, and hepatic artery, together with the biliary ducts, are united together by means of the cellular substance, into compound clusters, somewhat resembling mulberries, commonly called *acini*, of an hexagonal shape, surrounded with a lax cellular texture. In these acini, likewise, there are mutual anastomoses between the portal branches and hepatic artery, with the roots of the vena cava on one side, and the first organs of the pori biliarii of the liver on the other side; which last inosculations, Mr. Fyffe says, are demonstrated by anatomical injections; for he found that liquors injected by the vena portarum returned again through the ductus choledochus.

Some anatomists of great eminence have taught, that the acini are hollow, having arteries and veins spread upon their external surface, and that they deposit the bile into their cavity, after it has been secreted from the branches of the vena portarum. This opinion they support by arguments taken from comparative anatomy, these acini being in brutes rounder and more defined than in the human subject; and from diseases, in which we find cells and round tubercles, filled with watery fluid, chalk, and various kinds of concreted matter. To this they might have added, the thick and sluggish nature of the bile itself, its similarity to mucus, and the analogy of the follicles of the gall-bladder.

But the present state of anatomy will not allow any follicles into which the small secretory vessels open; for such follicles would intercept the course of anatomical injections, and give us the appearance of knots, intermediate between the secretory vessels and the biliary pores, which we have never yet been able to see: for the wax flows immediately into a cavity, in a continued thread from the vena portarum into the biliary ducts, without any interruption or effusion. Again, a follicular or glandular fabric is not allowable in the liver, from the great length of the biliary ducts. For all follicles deposit their contents into some space immediately adjacent; for they are unfit to convey their secerned fluid to any length, as they destroy a great part of the velocity imparted by the arteries. Lastly, the common pressure which we must suppose to be on these acini, would so crush them, that no assistance could from thence be brought to promote the motion through the excretory ducts. Concretions and hydatids are formed in the cellular substance; and, lastly, the bile, when first secreted, is sufficiently fluid.

The celebrated Haller asserts, that no bile is separated from the hepatic artery; because the peculiar structure of the vena portarum would be useless if it secreted nothing. Its office in secretion appears plainly by the continuations of its branches with the biliary ducts, in a manner more evident than that of the artery: but it appears by experiments, also, that the biliary secretion continues to be carried on after the hepatic artery is tied; add to this the largeness of the biliary ducts, in proportion to so small an artery, with the peculiar nature of the blood collected in the vena portarum, so extremely well fitted for the formation of the bile. But in the blood of the hepatic artery, Haller says, we can find nothing peculiarly fit for the secretion of bile, or analogous to it in quality.

Since, therefore, the vena portarum conveys the blood ready charged with biliary matter, fit to be secreted in the least acini, and from thence there is an open free passage, without any intermediate follicles, from the ultimate branches of the vena portarum into the beginning roots of the biliary ducts, and that the humours driven into the vena portarum may easily choose this passage, the bile will be expelled from thence by the force of the blood urging behind, as well as by the auxiliary force of the diaphragm pressing the liver against the rest of the viscera in the abdomen when full; and again, the diaphragm contracted in exspiration, will force the bile into the larger branches, and lastly, into the two trunks of the *ductus biliarius hepaticus:* which trunks meet together upon the vena portarum, in the transverse fossa of the liver, near the anonymous lobule.

The structure of this duct is like that of the intestines, except that there do not appear to be any muscular fibres. From experiments, it appears to be endowed with a moderate degree of irritability. That it is vastly dilatable, and extremely sensible, is shewn from calculi, and other diseases which we need not particularise.

The hepatic duct passes upon the vena portarum, more to the right than the artery, towards the pancreas: and then descending obliquely, covered by some part of the latter, it goes to the lower part of the second flexure of the duodenum, and is inserted backward about four or five inches from the pylorus, through an oblique oblong sinus made by the pancreatic duct, into which it opens by a narrow aperture. This sinus runs a great way through the second cellular coat of the duodenum obliquely downward; then it perforates the nervous coat, and goes on again obliquely between it and the villous coat; and, lastly, it opens into a protuberant long wrinkle of the duodenum. There is nearly the space of an inch, between the insertion and egress of this duct through the coats of the duodenum, occupied by a sinus which surrounds and receives the ductus choledochus, in such a manner, that when the coats of the intestine are distended by flatus, or closely contracted by a more violent

peristaltic motion, the opening of the duct must be consequently compressed or shut; but when the duodenum is relaxed and moderately empty, the bile then has a free exit. Any regurgitation from the duodenum is hindered by this obliquity and wrinkling of the duct, for it may be very easily pressed together or closed; the regurgitation may also be prevented by a succession of fresh bile descending perpendicularly from the liver.

Just at the portæ this duct receives from the gall-bladder another smaller canal of the same kind, which for a good distance runs parallel with it, and is inserted into it by a very acute angle. This, which is called the cystic duct, from its origin, is sometimes first increased by another small duct from the liver before its insertion. The gall-bladder, from which this duct rises, is a peculiar receptacle for the bile. (See GALL-BLADDER.) Most animals are furnished with it; some, however, want it, as most of the swift-running, and many of the herbivorous animals, as the horse.

The generality of animals have, between the gall-bladder and liver, or between the ducts coming from both, some peculiar openings in the gall-bladder, into which some ducts, originating from the liver, or the hepatic biliary duct, discharge their contents. In man these ducts have not yet been clearly demonstrated; and the gall-bladder is easily loosened from the liver, without the smallest drop of bile distilling either from it or from the liver. There is also a thin water found in the gall-bladder as often as the cystic duct is obstructed.

The bile flows naturally both out of the gall-bladder and liver, so long as there is no obstruction; so that both ducts swell when that passage is tied or filled up, and the cystic lies in a straight line with the cholidochus. There is no necessity for all the bile to be diverted into the gall bladder before it flows into the duodenum; nor is there any permanent obstacle to hinder the afflux, and peculiarly resist the hepatic bile, and admit the cystic. The passage into the ductus cholidochus is larger and straighter, the ductus cysticus much less than the hepatic, nor is that duct so well formed for receiving all the bile; the cholidochus being much larger than the cystic duct, cannot therefore be made only for the reception of its bile. There are many animals in which the hepatic duct discharges its contents into the intestine without any communication with the cystic. In living animals, even when the cystic duct is free, the bile appears to descend into the duodenum in a perpetual current. That the quantity is very considerable, appears from the magnitude of the secretory organ, and the excretory duct, so many times larger than the salival ones, and from diseases, in which four ounces of the cystic bile have flowed through an ulcer of the side daily. The hepatic bile goes into the bladder, as often as there is any obstruction in the duodenal sinus, from flatus or any other cause compressing the end of the ductus cholidochus. Accordingly we find it extremely distended, whenever the common biliary duct is obstructed or compressed by any kind of tumor, whence the gall-bladder is sometimes enlarged beyond all belief; and if the cystic duct be tied, it swells between the ligature and hepatic duct; and in living animals, the hepatic bile visibly distills into the wounded gall-bladder. The retrograde angle, or direction of this duct, is not so repugnant to such a course of the bile; for a very slight pressure urges it from the liver into the gall-bladder, and even air may be easily driven the same way, more especially if the duodenum be first inflated. There does not seem to be any sort of bile separated by the gall-bladder itself; for whenever the cystic duct is obstructed by a small stone, or a ligature made upon it, we find nothing separated into the gall-bladder more than the exhaling moisture, and a small quantity of insipid mucus secreted from the follicles. In many animals, we meet with no appearance of any gall-bladder, when at the same time there is a plentiful flux of strong, well prepared, and salutary bile discharged into the intestines. Again, it does not seem probable, that the cystic branch of the vena portarum can separate bile into the gall-bladder; for that vein in itself is a mere reconductory vessel: nor can any be separated from the hepatic artery; for it must be beyond all probability, that such a strong bile as that of the gall-bladder, should be separated from a milder blood than that which affords the mild hepatic bile.

Lastly, we may observe, that the bile flows also from the gall-bladder to the liver, and at length returns into the blood, when its passage into the intestines is totally intercepted. A latent cause in the nerves may also occasion this regurgitation. This passage or absorption of the bile into the system is pernicious, and is the occasion of jaundice; which, when the offending stones or concretions are removed, is cured by the bile's free course into the duodenum being restored again. (See JAUNDICE.)

Some of the hepatic bile received into the gall-bladder, stagnates, from being only a little moved in respiration. By degrees it there exhales its thinner parts, which, as we have seen, filtrate through the adjacent membranes. The remainder being a fluid of a soapy subalkaline nature, digested in a warm place, grows sharp, rancid, more thick, bitter, and of a high colour: for this is the only difference between the cystic and hepatic bile; the latter being weaker, less bitter, lighter coloured, and of a thinner consistence, while it remains within its proper hepatic ducts. That the difference between them proceeds only from stagnation, appears from such animals as have only a larger porus hepaticus, instead of a gall-bladder; for here we

find the bile, which stagnates in the larger hepatic pore, is considerably more bitter than that in the smaller pores of the liver; as, for example, in the elephant. But the gall-bladder gives this particular advantage, that it receives the bile when the stomach, being empty, has no need for it, that afterwards it may be able to return it in greater plenty, when we principally want it for the digestion of the aliments now passing in great quantity into the duodenum. This flow of the bile is quicker in proportion through the cystic duct, as the section of that duct is less than the section of the gall-bladder.

The gall-bladder, indeed, hardly touches the stomach, but the beginning of the descending duodenum. But when the stomach is extremely distended, and in a very full abdomen, it makes a considerable pressure both upon the liver and duodenum; by which the gall-bladder is urged, and its bile expressed. Thus the bile flows through a free passage from the gall-bladder into the common duct and the duodenum: and this it does more easily in persons lying on their backs; in which posture the gall-bladder is inverted, its bottom being upward. Hence it is that the gall-bladder becomes so full and turgid after fasting. The expulsive force of the bile is but little more than that of the pressure received from the stomach and diaphragm; for as to any muscular force residing in the fibres of the proper membrane, which may be thought to contract the gall-bladder, it must be very weak and inconsiderable.

The hepatic bile is always bitter, but the cystic is more so, always viscid; of a full yellow colour, with a tincture of green; miscible, by triture, either with water, oil, or vinous spirits; coagulable by mineral acid liquors; dissoluble by alkalies, especially the volatile kinds; and extremely well adapted to dissolve oily, resinous, or gummy substances; quickly putrefying, and by putrefaction spontaneously degenerating to a musk-like odour. Its chemical analysis, and experiments of mixture with various substances, demonstrate, that it contains a large portion of water, and a considerable quantity of inflammable oil, which, in stones of the gall-bladder, appears very evidently. The bile, therefore, is a natural soap; but of that sort which is made from a volatile saline lixivium, mixed with oil; and has its water along with it. This, therefore, being intermixed with the aliment, reduced to a pulp, and slowly expressed from the stomach by the peristaltic force of the duodenum and pressure of the abdominal muscles, incorporates them all together; and the acid or acescent qualities of the food are in some measure thus subdued, the curd of milk is again dissolved by it into a liquid, and the whole mass of aliment inclined more to a putrid alkalescent disposition. It dissolves the oily matters, so that they may freely incorporate with the watery parts, and make up an uniform mass of chyle to enter the lacteals; the surrounding mucus in the intestines is hereby absterged and attenuated, and their peristaltic motion is excited by its acrimony; all which offices are confirmed, by observing the contrary effects from a want or defect of the bile. Nor is the hepatic bile sufficient to excite the necessary motion of the intestines, if the cystic be wanting: both then are of so much use and importance to the animal, that we find, by experiment, even the strongest will perish in a few days, if the flux of bile to the intestines be intercepted, by wounding the gall-bladder.

Thus it slowly descends along with the alimentary mass; and having spent its force, or changed its bitterness by putrefaction, most of it is afterwards excluded together with the feces; but probably some of the more subtle, watery, and less bitter parts, are again taken up by the absorbents. It returns the less into the stomach, because of the ascent of the duodenum, which goes under the stomach, with the resistance it meets with from the valvula pylori, and the advancement of the new chyle which the stomach adds to the former: in man, however, it frequently enters; and always in birds. The bile is of a sweet soft nature in the fœtus; for in them the blood seems not sufficiently charged for its secretion to supply putrid alkaline vapours to the liver, nor are there any oily or fat substances absorbed from the intestines. As the bile is a viscid fluid, and thickens by inactivity of body in fat animals, and in us from the same causes, especially when the blood moves languid from grief, or by any other cause, the circulation is rendered more languid, it easily coagulates into an hard, somewhat resinous, and often stony substance, insomuch that stones of the gall, are much more frequent, as experience teaches us, than those of the urinary, bladder. Indeed, the instances of this, recorded by anatomical and medical writers, are not only numerous, but furnish matter of much curious enquiry.

The use to which the liver is subservient, besides secreting the bile, is manifested in the fœtus. It seems to transmit the blood brought back from the placenta, and to break its force. Even in an adult person it has the same use, though less manifestly, namely, to retard the return of blood coming back from the viscera appointed for preparing the chyle; and this may account for the size of this viscus, which alone seems to indicate that it is formed for purposes more considerable than the secretion of bile, though these purposes have not yet been discovered by anatomists.

The primary uses of this fluid, so important in the animal economy are; 1. *To extricate the chyle from the chyme:* thus chyle is never observed in the duodenum before the chyme has been mixed with the bile: and thus it is that oil is extricated from

linen by the bile of animals. 2. By its *acridity* it excites the peristaltic motion of the intestines; hence the bowels are so inactive in people with jaundice. 3. It imparts a *yellow colour* to the excrements; hence the white colour of the fœces in jaundice, in which disease the flow of bile into the duodenum is entirely prevented. 4. It prevents the *abundance of mucus and acidity* in the primæ viæ; hence acid, pituitous, and verminous saburra are so frequent from deficient or inert bile.

Various morbid affections result from particular states of the bile, or rather from its access to the stomach, the scantiness or redundancy of it in the intestines, &c. These are spoken of under their several names. See ICTERODES, DYSENTERY, GALL-STONES, HEAD-ACH, &c.

BILIOUS, an epithet popularly applied to all diseases and affections in which there is an inordinate secretion of bile, or in which it is supposed to be endued with unusually active properties. Thus we have bilious fevers, bilious dysenterics, bilious vomitings, &c.

BILIOUS FEVER; called also the MARSH REMITTENT, AUTUMNAL REMITTING, and CAMP FEVER. When a *fever* is accompanied with *bilious* discharges by vomit or stool, whether it be continual, intermittent, or remittent, it is called *bilious*. It is the second species of typhus, in Dr. Cullen's Nosology, named *icterodes*, defined a typhus, with yellowness of the skin. See ICTERODES.

BILOCULA'RES, (from *bis* twice, and *loculus*, a little cell); the name of the thirtieth class or family, in Gerrard's arrangement of the plants that are natives of Provence in France. It consists of the following genera: jessamine, *jasminum;* privet, *ligustrum;* the olive, *olea;* speedwell, *veronica;* mock-privet, *phillyrea;* and the ash-tree, *fraxinus.*

Dr. Milne observes, in his Botanical Dictionary, that the title of this order would seem to import, that the several genera in question were furnished with a seed-vessel divided into two *loculi* or cells; yet, in fact, there are but two genera, jessamine and speedwell, that answer strictly to this description; the rest having either a seed-vessel furnished with one cell only, as the olive, privet, and mock-privet; or no seed-vessel at all, except the crust or tough covering of the seed, as the ash-tree. The plants of this natural family make part of the order of *Sepiariæ* of Linnæus; and, with the exception of the ash, are all brought into the class *Diandria*, in the Sexual System. See SEPIARIÆ, and DIANDRIA.

BINA'TUS, (from *binus*, double); in botany, a term denoting, when applied to leaves, such as point two ways.

BINDWEED. See CONVOLVULUS MAJOR ALBUS.

BINGA'LLE. See CASUMUNAR.

BIOTHA'NATI, (βιοθανατοι), a term applied by the ancients to those who died a violent death.

BIPARTI'TUS, (from *bis*, twice, and *partior*, to divide), in botany, consisting of two divisions, as in the pericarpium.

BIPE'TALUS, (from *bis*, twice, and *petalum*, a petal). In botany it means having two petals or flower-leaves.

BIPINNA'TUS, (from *bis*, twice, and *pinna*, a wing), doubly winged. In botany it is applied to a stalk pinnated by stalks, which are themselves pinnated by leaves.

BIRCH-TREE. See BETULA.

BIRD-LIME, a viscid substance, used for catching birds, flies, &c. by the legs. It is prepared after different ways; but the most common bird-lime among us is made from holly-bark, which is boiled ten or twelve hours, and when its green coat is separated from the other, it is covered up for a fortnight in a moist place. It is then pounded into a tough paste, so that no fibres of the wood are discernible, and washed in a running stream till no motes appear. Lastly, it is put up to ferment four or five days, skimmed as often as any thing arises, and laid up for use. A third part of nut-oil, or thin grease, must be incorporated with it, over the fire, before it is fit to be employed.

The juice of holly-bark is a very peculiar substance, and worthy of chemical examination. If trials were made, it seems probable that many other vegetable juices would be found to have the same clammy nature. The misletoe affords a juice, even superior to that of holly; and if a young shoot of the common alder be cut through, there will be a stringy juice draw out in threads, and follow the knife like bird-lime or the juice of the holly. It seems in this tree to be lodged, not in the bark, but in certain veins, just within the circle of the wood. The roots of all the hyacinths also afford a tough and stringy juice of the same kind; and so does the asphodel, the narcissus, and the black bryony root, in a surprising quantity.

BIRDS, a class of animals, which, according to the Linnæan system, includes six orders; viz. *Accipitres*, *Picæ*, *Gallinæ*, *Anseres*, *Grallæ*, and *Passeres*. From the two first, as being carnivorous animals, hardly any of our aliments are taken; but from the four other orders a great number are devoted to human sustenance.

Birds, like quadrupeds, have two ventricles of the heart, and have their blood of nearly the same temperature with that of quadrupeds; and the parts which we employ as aliments, are nearly of the same qualities as those of the quadrupeds usually eaten. Therefore the general doctrine with respect to their solubility (see DIGESTION and ASSIMILATION), alkalescency, and nutritious quality, need not be repeated here; and it only remains for us to say, in what manner the aliment taken from the several genera and species of birds may be distinguished.

1. We begin with the order *Gallinæ*, from which

the greatest number of aliments are taken. Of this order, Dr. Cullen, says, the species most frequently employed is the dunghill cock and hen, more strictly called *gallinaceous.* "Making allowance," says he, "for the difference of age, the flesh of this species being always white, is the most tender and the least alkalescent, and therefore among the least stimulant of animal food. On this account, the *chicken*, or the young of this species, is most commonly allowed when we are afraid of the irritation of animal food; and upon the general principle of the young of every species being the most soluble and least alkalescent, the practice seems to be well founded. But, as has been observed in the instance of veal, the flesh of young animals is sometimes more difficultly digested than that of the old; therefore, the fact given us by Dr. Bryan Robinson, is an instance of it in the case of chicken; and though this cannot be supposed to be a common case, yet some instances of it certainly have happened."

In the common domestic fowl, the difference depending on age is sufficiently remarkable; so that after a year old, the animals of this species, according to their advanced age, are constantly becoming proportionably more difficult of solubility. Before they are a year old, the difference arising from sex is not very remarkable; but after that period, even that becomes more and more considerable. In these also, the effects of castration are considerable; and the *capon* and *poulard* become readily fatter, and retain their tenderness much longer than the cock or hen, whose genitals are in their perfect state. In feeding this species for the table, a difference of management often takes place; and though the barn-door fowl, as it is called, is certainly an unexceptionable aliment, yet Dr. Cullen thinks, a crammed fowl, as being more alkalescent, is also more sapid and tender; and for what he can perceive, a sufficiently innocent food.

There are of this species many varieties marked by naturalists; but they appear to differ only in their external forms, and scarcely afford any difference when used as aliment.

Very much of the same nature with the species we have been speaking of, is the *Gallopavo*, or Turkey, and the *Guinea-hen (Numida*, Linn.) This, killed at a certain age, affords an aliment as tender and as little alkalescent as the dung-hill fowl.

The *Pavo* or Peacock, taken in whatever state, is a considerable degree less soluble than any of the preceding species; and although vanity might have formerly set it upon the Roman tables, it is hardly ever, except in its very youngest state, admitted to the tables of modern Europe, nor is it, in fact, so suitable an aliment as the birds already described.

Of the wild species of the gallinaceous order, the first to be mentioned is the *Pheasant;* which, Dr. Cullen says, from its nature and greater exercise, is less soluble than any of the domestic fowls; and though, from the same causes, it is more alkalescent, this does not render it, except in its very young state, very easy of digestion.

The same eminent writer, after the pheasant, puts the birds of the *Partridge* and *Quail* kind. Of the former, he says, there is a great variety; but how far they differ as aliments, he is not exactly informed, though he is persuaded that it is not in any considerable degree. The partridge of this country is of a much tenderer substance than the pheasant: and though also less alkalescent than that, it is from its exercise more so than the domestic fowl. From thence its qualities and those also of the quail, as aliment, may be readily understood, these being nearly the same.

The *Tetrao Urogallus*, and the other *Tetraones pedibus hirsutis*, are of different qualities from those of the partridge kind or the *Tetraones pedibus nudis.* Of the former there are four species in Scotland. First, the *Cock of the Mountain*, a species once frequent in Britain, under the name of the *Capercailzie*, is now almost entirely lost. The other species are, the *black cock*, or the *tetrao tetrix cauda plena:* the third is the *red game*, not known to Linnæus, probably, Dr. Cullen thinks, the *Atagas* of Buffon: and the fourth is the *Ptarmigan*, *tetrao lagopus* Linn. and the *Gelinotte d'Ecosse* of Buffon.

To all these Dr. Cullen attributes one common quality as aliments. The three first, he says, are naturally of a tender substance; and they are still more so from their alkalescence, which is considerable. From both circumstances, they are sapid and agreeable to most persons, but at the same time must be considered as a considerably stimulant food. The Ptarmigan is a drier food, less tender and less sapid than the other three species.

2. The second order of the birds that afford aliments suitable for human subsistence is that of the *Anseres*, or water-fowl.

Of these the most noted for its bulk and figure is the *Cygnus* or *Swan;* but its flesh is too firm, and so difficult of solution that it is little employed as an article of food.

Of qualities approaching to that of the swan is the *anser domesticus* or tame *goose;* but being less exercised, and living much on vegetable aliment, it is of a more tender substance: yet was it not for its alkalescency, it would still be difficult to digest. Upon this account the *tame duck (anas domestica)*, as living more upon animal food, is still more alkalescent and easy of solution. Of both these species, the young animals, being more viscid, are more slowly digested than those that are more advanced. Of the *anas* also there is a wild kind, which, as more alkalescent, is more easily digested than the other.

"Of the anserine tribe," says Dr. Cullen, "there are a great number besides those mentioned above, that afford aliment, and are much of the same qualities. With respect to most of them, as they are sea-birds and live upon fish, they are more alkalescent, and very often on that account are tender and of easy digestion. They are commonly of a strong odour, and of a rank fishy taste, and from hence, to many persons, they are highly disagreeable; but to others, to whom their odour is not so offensive, their sapid and tender flesh is highly agreeable, and generally proves very easy of digestion. These circumstances are particularly applicable to the peculiar Scottish food, the *Solan Goose*."

3. The next order of birds taken notice of by Dr. Cullen is that of the *Grallæ*, which comprehends a great number of species possessing very different qualities: indeed, he says he cannot find that any one quality is common to the whole order. "As they are birds of more or less exercise, they are accordingly of a firmer and less soluble substance; and as many of them are sea-birds, living very entirely upon fish, they are considerably alkalescent, and in their flavour and taste come near to the nature of the anserine kinds, that resort to the same diet. The effects of exercise on the particular parts of an animal appears in birds of this tribe. The *Woodcock* and *Snipe*, birds that greatly exercise the muscles of the breast in flying, are of a firm and less soluble texture; while the legs, which are little exercised, are more tender."

4. The fourth order of birds affording aliments, is that of the *Passeres*; a very numerous tribe, to which, however, as alimentary, Dr. Cullen can assign no common quality. There is one genus, indeed, among those most frequently used, that seems to have qualities different from most of the other *passeres*, to wit, the *Columba* or *Dove*; a genus of which several species might be used if we could obtain them in their young state. But we are only acquainted with the pidgeon in common use (*columba domestica* Linn.), which, taken in its young state, before it has had any exercise, is sufficiently tender. But nature, independent of food or exercise, has made it of a very alkalescent quality, from whence, though tender, even in its youngest state, it is a very heating food. Of the other *passeres* Dr. Cullen says, almost all, when in their fattened state, are sufficiently tender and easily digested; and according to their diet on grain or worms, are more or less alkalescent.—The aliment afforded in the eggs of birds is noticed under the article Eggs.

BIRD'S-TONGUE, a name given by some to the seeds of the *Fraxinus excelsior* Linn.

BI'RSEN, an Arabian or Persian word, signifying an inflammation, or an abscess, in the breast.

BIRTHWORT. See Aristolochia.

BIRTHWORT, CLIMBING. See Aristolochia tenuis.

BISCUTE'LLA, buckler's mustard; a genus in Linnæus's botany. He enumerates six species.

BISE'RRULA, a genus in Linnæus's botany. There is but one species.

BISHOP'S WEED. See Ammi.

BISKET, or Biscuit, a kind of bread prepared as a luxury, by the confectioners, of fine flour, eggs, and sugar, and rose or orange-flower water; or of flour, eggs, and sugar, with aniseeds and orange-peel, baked again and again in the oven, in tin moulds. There are many sorts of biskets; the simplest is that called sea-bisket, which is a sort of bread, and indeed so named on ship-board. It consists of flour and water paste, much dried by passing the oven twice, to make it keep for sea-service. For long voyages they bake it four times, and prepare it six months before the embarkation. It will keep good a whole year, if properly dried. To preserve sea-bisket from insects, Mr. Hales advises to pass the fumes of burning brimstone through the casks full of bread. Bisket may be likewise preserved a long time, by keeping it in casks well calked, and lined with tin. The ancients had their bisket prepared after the like manner, and for the like use, as the moderns. The Greeks called it *αρτον διπυρον*, *q. d* bread put twice to the fire. The Romans gave it the name of *panis nauticus*, or *capta*. Pliny denominates it *vetus aut nauticus panis tusus atque iterum coctus*. By which it appears, that, after the first baking, they ground or pounded it down again for a second. In some middle-age writers, it is called *paximas*, *paximus* and *panis paximatus*. Among the Romans, we also meet with a kind of land-bisket for the camp-service, called *buccellatum*, sometimes *expeditionalis annona*, which was baked dry, both to make it lighter for carriage, and less liable to corrupt, the coction being continued till the bread was reduced one fourth of its former weight.

BISLI'NGUA, (from *bis*, twice, and *lingua*, a tongue); so called from its appearance of being double tongued; or of having upon each leaf a less leaf.

BISMUTH, (from *bismut*, Germ.) one of the semi-metals, of a reddish or yellowish-white colour, and a lamellated texture, and moderately hard and brittle, so that it not only breaks into pieces under the strokes of the hammer, but may even be beaten to powder. It is the heaviest of all the semi-metals, weighing from 9.600 to 9.700, and is still more fusible than lead. It is found,

1. *Native*. Bismuth is found more commonly in a native state than any other metallic substance. It is usually crystallized in cubes or octagons, or in the form of dendrites or thin laminæ investing the ores of other metals, particularly cobalt.

2. *Native Oxyd of Bismuth*, in which the metal

is mineralized by aërial acid, is either in form of a powder or indurated like mortar. It is frequently of a greenish-yellow colour, being mixed with the ores of other metals. The red and yellow part is most commonly cobalt ore; though it has often been mistaken for bismuth. It is frequently found in glittering particles interspersed through stones of various kinds. Silver, iron, and other metals, are also found in it.

3. *Mineralized by the Vitriolic Acid.* This is said to be of a yellowish, reddish, or variegated colour, and to be found mixed with the calx of bismuth incrusting other ores.

4. *By Sulphur.* This is found chiefly in Sweden, is of a blueish-grey colour, a lamellated texture and tesselar form like galena, but much heavier; sometimes presenting parallel striæ like antimony. It is said to contain cobalt and arsenic as well as bismuth. It is very fusible, and the sulphur it contains may be mostly separated by scorification.

5. *By Sulphur and Iron.* This ore is said to be of a lamellar cuneiform texture, and to be found in Norway. This kind of ore yields a fine radiated regulus; for which reason it has been ranked among the antimonial ores by those who have not taken proper care to melt from it a pure regulus, or one destitute of sulphur. In Schneeberg they have what is called *columbine* bismuth and *plumose* bismuth; the former taking its name from the colour, the latter from its texture. The latter is said to contain a great quantity of cobalt.

6. *With Sulphur and Arsenic.* This ore is generally of a whitish-yellow or ash colour, has a shining appearance, and is composed of small scales or plates intermixed with small yellow flakes. Its texture is hard and solid; sometimes it strikes fire with steel. It has a disagreeable smell when rubbed; does not effervesce with acids, but is partially dissolved by the nitrous acid. The solution, diluted with water, becomes a kind of sympathetic ink; the words written with it on white paper being invisible when dry, but assuming a yellowish colour when heated before the fire. There is also a grey bismuth ore of the arsenicated kind, with a striated form, found at Helsingland in Sweden, and at Annaberg in Germany. Another of the same kind, with variegated colours of red, blue, and yellowish grey, is likewise found at Schneeberg in Saxony. At Misnia in Germany, and at Gillebeck in Norway, it is also found striated with green fibres like an amianthus. At Georgenstadt in Germany, and at Annaberg in Saxony, it is intermixed with reddish-yellow shining particles, called by the French *Mines de Busmuth Tigreas.* The *minera bismuthi arenacea* mentioned by Wallerius and Bomare belongs to the same kind of arsenicated ores.

This semimetal is scarcely altered by exposure to the light. In close vessels it sublimes without any alteration; and if permitted to cool slowly, it crystallizes in Greek volutes. It crystallizes also more easily than any other metallic substance. Heated with access of air, its surface, when melted, soon becomes covered with a greenish-grey or brown calx. If the metal be heated at once to ignition, it burns with a small blue flame scarcely sensible, and the calx evaporates in a yellowish smoke, which condenses into flowers of the same colour. Mr. Geoffroy observed, that the flowers which rise last are of a beautiful yellow colour like orpiment. By exposure to the heat of a porcelain furnace, a part of the semimetal flowed out through a crack in the vessel, and the portion which remained in the vessel formed a glass of a dirty violet colour, while the bismuth melted in contact with the external air was yellowish. By exposure to the atmosphere the surface of this metal becomes somewhat tarnished, and its surface covered with a whitish rust. It is not attacked by water, nor does it combine with earths; but its calces give a greenish yellow tinge to glasses. It is employed by pewterers to communicate hardness to tin; and may be used instead of lead in the cupellation of metals. It resembles lead in many respects, and is known to be equally deleterious if taken internally, or absorbed from the skin.

Most metallic substances unite with bismuth, and are thereby rendered more fusible than before; hence it is used in the making of solder, printers types, &c. as well as pewter. When native, it is of a yellowish-white colour, and so fusible, that it melts at the flame of a candle. By calcination it gains about half an ounce in the pound. This oxyd is said to promote the vitrification of earths, and of the refractory metallic calces more powerfully than lead, and likewise to act as a more violent corrosive on crucibles than the glass of lead itself. Hence it is preferable to lead for the purification of gold and silver, destroying more effectually the baser metals with which they have been adulterated. In all operations of this kind, where sulphur makes one of the heterogeneous matters to be destroyed, bismuth is of the greatest service, on account of its forming with sulphur an extremely fusible compound, while that of lead and sulphur proves very refractory.

Bismuth readily amalgamates with mercury, and the compound formed by this means will adhere to iron. On exposing the iron thus coated with amalgam, to a considerable heat, the mercury flies off, and the greatest part of the bismuth adheres to the iron, which thus looks as if it had been silvered. If mixtures of bismuth, with some other metals, particularly lead, be amalgamated, the lead becomes so thin as to pass through leather along with the mercury; but on standing, the bismuth is thrown upon the surface in the form of a dark-coloured powder, the quicksilver and lead remaining united. From this property it is too often used for the pur-

pose of adulterating quicksilver; as rendering a very considerable portion of lead intimately combined with it. One part of this metal with another of bismuth, may be united with three of quicksilver, without affecting its fluidity. The quicksilver thus adulterated is not only unfit for medicinal uses, but even for the common mechanical purposes of gilding and silvering; as the workmen find, in this case, that it leaves a leaden hue upon the gold or silver, which spoils the fine appearance of the work. If the abuse happens to be discovered, the mercury may be purified by distillation to a certain degree, though, according to Boerhaave, it is impossible ever to free it totally from a mixture of any of the imperfect metals.

Bismuth readily unites by cementation with sulphur, and melts with a more gentle heat than when alone; but on continuing the fire, a separation takes place, the bismuth falling to the bottom, and a sulphureous scoria swimming on the surface. Sulphur is likewise very readily absorbed by the calx of bismuth. A curious needle-formed mass is the product of their union, in appearance exactly resembling antimony, but contracting a reddish tinge on the outside by exposure to the air. The calx cannot take up quite half its weight of sulphur.

With the compound of oxyd of bismuth and sulphur in a very gentle heat, silver melts into a brittle regulus. With a stronger fire gold also unites with it, forming a brittle compound, whose particles somewhat resemble an ore, with some striæ and shining ones among them. Copper melts with it in a gentle heat, and the compound retains a remarkable degree of fusibility: on the addition of lead a new combination takes place; the copper and sulphur rise to the top in scoria resembling an ore, whilst the bismuth and lead unite into a regulus at the bottom. Zinc and bismuth will not unite; the former melting and burning on the surface as it does by itself. Equal parts of lead, tin, and bismuth, form a blackish sparkling compound like the dried ores of lead.

The specific gravity of a mixture of bismuth and copper is exactly the mean betwixt that of the two ingredients unmixed. With iron the compounds are specifically lighter than each of the ingredients; but with gold, silver, tin, lead, and regulus of antimony, they turn out heavier than either of the ingredients. None of the destructible metallic substances are capable of being revived so easily as bismuth. The calx heated strongly in a close vessel melts into glass.

This semimetal is most commonly lodged in cobalt-ores; which, when of a high red, or peach-bloom colour, are called *bismuth bloom*, or *flowers of bismuth*. It has been supposed, that bismuth communicates to glass the same blue colour with cobalt, because the dross which remains after the bismuth has been melted out, and called by the smelters *bismuth grain*, sometimes produces that effect. But as no such grains or colouring-matter remains from pure bismuth, it is plain, that this property must depend on something mixed with the semimetal, and which was undoubtedly nothing but some cobalt-ore united with the bismuth.

The *flowers* and *magistery* of bismuth had formerly a place in our dispensatories, but both have been discontinued.

BISQUE, or Bisk, a rich sort of broth or soup, made of pigeons, chickens, force-meat, mutton-gravy, and other ingredients. The word is French, formed, as some think, from *biscocta;* because the bisque, consisting of a diversity of ingredients, needs several repeated coctions to bring it to perfection. There is also a *demi-bisque*, made at a low expence, in which only half the ingredients are used; and a bisque of fish, made of carps, minced with their roes, and lobsters.

BISTO'RTA, (quasi *bis torta; twice twisted*, or wreathed) so called from the figure of its roots, BISTORT; called also the *greater bistort* or *snake-weed.* It is the *polygonum bistorta*, or *polygonum caule simplissimo monostachyo, foliis ovatis in petiolum decurrentibus* Linn. Class, *Octandria.* Order, *Trigynia.*

It is a plant with oval, pointed, wrinkled leaves, of a dark green colour above, and blueish underneath, standing on long pedicles, and continued a little way down the pedicles, forming a narrow margin on each side. Among these arise round, slender, jointed, unbranched stalks, furnished with smaller and narrower leaves, which have no pedicles, bearing, on the top, spikes of imperfect five-leaved red-flowers, which are followed by triangular leaves. It is perennial, a native of Britain, grows wild in moist meadows, about Battersea, and by the side of Bishop's Wood, near Hampstead, and flowers in May and June.

The root is bent vermicularly, whence its name, and jointed at each bending. It is commonly about the thickness of a finger, surrounded with bushy fibres, of a blackish brown colour on the outside, and reddish within. It is distinguished from the other *bistort* roots by being less bent; that of the officinal species having only one or two bendings, and those of the other three or more.

This root is powerfully astringent, antiseptic, and diaphoretic. Water totally dissolves its astringent matter. Extracts made with water, or with spirit, retain all the styptic qualities. All the parts of this plant possess the same qualities as the root, but in a less degree. If the roots are boiled in vinegar, an excellent antiseptic gargle is obtained. Dr. Cullen says it seems to be one of the strongest of our vegetable astringents, and justly commended for every

virtue that has been ascribed to any other: he frequently employed it in intermittents, and gave it both by itself, and along with gentian, to the quantity of three drams in one day.

The powers of this remedy are not more considerable than those of the tormentil root, which is often substituted for it.

BI'STOURY, an instrument used in surgery, for making incisions. There are different kinds, some being of the form of a lancet, others straight and fixed in the handle like a knife, and others crooked, with the sharp edge on the inside. See INSTRUMENTS.

BITERNA'TUS, (from *bis*, twice, and *ternus*, three-fold), in botany, having three divisions, and three subdivisions.

BI'TI, a tall evergreen tree in Malabar, and other parts of the East Indies. An oil is prepared from its root to cure the *Alopecia*.

BITTER APPLE. See COLOCYNTHIS.

BITTER CUCUMBER. See COLOCYNTHIS.

BITTER GOURD. See COLOCYNTHIS.

BITTER-SWEET. See DULCAMARA.

BITTERN. When the brine is evaporated for obtaining salt for the table, and all the purer salt has been collected from it, there remains at last a large quantity of liquor which refuses to yield any crystals. These liquors are very bitter, and are called by chemists *Mother-Waters;* but, that now spoken of is called *bittern* in the salt works. The *bittern*, or mother-water of sea-salt, contains a great quantity of sea-salt with an earthy basis, and a little Glauber's salt.

BITTERS. See AMARA.

BITU'MEN, (in the Greek, πίτυμα; from πίτυς, a pine; because it flows from the pine-tree; or, *quod vi tumeat e terra*, from its bursting forth from the earth). Bitumens are combustible, solid, soft, or fluid substances, of a smell that is strong, acrid, or aromatic. They are composed of hydrogen and carbon, with a mixture of earth and other fossil substances in small proportions. They are found either in the internal parts of the earth, or exuding through the clefts of the rocks, or floating on the surface of waters. See ASPHALTUM.

BIVA'LVA, (from *bis*, twice, and *valva*, door), bivalve, in botany, denotes the pods and husks of plants which open lengthways, in two parts, like the shell of a muscle.

BIVE'NTER, (from *bis*, twice, and *venter*, a belly). A muscle is named biventer, and sometimes *digastricus*, that has two bellies. The muscle particularly called *biventer* arises from the *processus mastoidæus*. Its tendon frequently joins the stylohyoidæus, and the membranous ring fixed to the os hyoides, and is then attached to the inner part of the chin. It depresses the jaw, and so opens the mouth. It is fleshy at both its extremities, and tendinous in the middle. The middle tendon passing through the aponeurotic ligament at the lateral part, and the root of the cornua of the os hyoides, is what renders it capable of performing its office.

BI'XA, the ROUCOU or *Arnotto-tree;* a genus of the monogynia order, belonging to the polyandria class of plants; and in the natural method ranking under the 37th order, *Columniferæ*. The corolla is ten-petalled; the calyx quinquedented; the capsule hispid and bivalved. Of this genus there is but one species known, viz. the *orellana*, a native of the warm parts of America. The seeds are covered with a red waxen pulp or pellicle, from which the colour called ANOTTA is prepared.

BI'XA ORELLA'NA; the systematic name for the *terra orleana* of the pharmacopœias. See ORLEANA.

BLA'CCIÆ, a name which Rhazes gives to the measles.

BLACKBERRY; the fruit of the common bramble, *Rubus fruticosus* Linn. These berries are eaten in great abundance by children, and are wholesome and gently aperient. Too large quantities, however, when the stomach is weak, produce flatulence, vomiting, and great distention of the belly. See FRUITS.

BLACK JACK, i. e. *Blende*. See BLENDE.

BLACK LEG, a name for the *Scurvy*. Also of the *Phlegmasia ulcerosa*, of Sauvages.

BLADDER. See VESICA URINARIA and GALL-BLADDER.

BLÆRIA, a genus in Linnæus's botany. He enumerates five species.

BLÆSITAS, stammering or lisping. It is the *Psellismus ringens* of Cullen.

BLÆSUS, (Βλαισος, a Greek primitive); the same as VALGUS, a bandy-legged person, or, one whose legs are bent outwards; one whose backbone is bended either forward or backward. The term is also used to denote a paralytic person, and one who has an impediment in his speech.

BLA'KEA, a genus in Linnæus's botany. He enumerates two species.

BLA'SIA, LEATHER-CUP; a genus in the Linnæan botany, of the order of *Algæ*, or thongs. There is but one species.

BLASTE'MA, (βλαστημα, from βλαστανω, to germinate); a bud, or off-set, or shoot of a plant: but Hippocrates expresses by it a cutaneous eruption or pimple.

BLA'TTA BYZA'NTINA, (βλαττιον, βυζαντιον, or *Byzantina*), called also *Unguis Odoratus*, and *Constantinople sweet-hoof*. The purple fish, the welk, and other fishes of the same kind, that have wreathed shells, have also operculæ or lids. These lids are of various shapes, and different substances; the matter of some of them resembles that of shells, others are like leather, and a third kind are horny. The horny and leathery kinds have a greasiness or

unctuousity, which, when they are burnt, exhales a strong smell, sometimes agreeable, but, most generally very fetid. The blatta byzantia, or unguis aromaticus vel odoratus of the ancients, was of the latter kind. It was called unguis from its likeness to a man's nail in its shape and colour. It has the properties of other shell-fish.

BLATTA'RIA; so Tournefort calls the VERBASCUM of Linnæus.

BLATTA'RIA LUTE'A; yellow moth-mullein.

BLATTARIOIDES; a species of hieracium.

BLE'CHNON; the lesser branched fern.

BLECHNUM; a genus in Linnæus's botany, of the order of ferns. He enumerates six species.

BLE'CHUM; a species of ruellia.

BLEEDING, or BLOODING; the opening of a blood-vessel, for the purpose of discharging a quantity of blood. This operation may be performed either on a vein or an artery, by means of a lancet, or any other suitable instrument: in a popular sense, however, the term bleeding simply denotes the opening a vein in the arm. The method of doing this is spoken of under the more general term BLOOD-LETTING; but we shall here speak of the accidents which sometimes succeed the use of the lancet in the common way.

Wounds of the nerves, tendons, and ligaments, at the bend of the arm, are attended with much more violent symptoms than might be expected, and they frequently resist every method of cure. In the simple process of venesection, it frequently happens, that the tendinous expansion called the *aponeurosis* of the biceps muscle is wounded, or even the tendon of that muscle itself is punctured by the point of the lancet; or, sometimes a nerve which happens to lie in the neighbourhood is partially divided. Wounds of this description, though they are the smallest we can well suppose to be given, are frequently very dangerous and difficult of cure. It sometimes immediately happens, on the introduction of the lancet, that the patient complains of a most exquisite degree of pain; and, when this occurs, we may rest assured that either a nerve or tendon has been wounded. On some occasions, by proper management, such as evacuating a considerable quantity of blood at the orifice newly made, by keeping the part at perfect rest, and preserving the patient in as cool a state as possible, the pain at first complained of will gradually abate, and at last go off entirely, without any bad consequence whatever. At other times, however, this pain, which occurs instantaneously on the introduction of the lancet, instead of abating, begins soon to increase; a fullness, or small degree of swelling, takes place in the parts contiguous to the wound; the lips of the sore become somewhat hard and inflamed; and, in the course of twenty-four hours or so from the operation, a thin watery serum begins to be discharged at the orifice.

If, by the means employed, relief is not soon obtained, these symptoms continue in nearly the same state for two, or perhaps three, days longer. At this time, the violent pain which at first took place becomes still more distressing; but, instead of being sharp and acute as before, it is now attended with the sensation of a burning heat, which still goes on to increase, and proves, during the whole course of the ailment, a source of constant distress to the patient. The fullness and hardness in the lips of the wound begin to increase, and the swelling in the neighbouring parts gradually extends over the whole member. The parts at last become exceedingly tense and hard; an erysipelatous inflammatory colour frequently appears over the whole surface; the pulse, by this time, has generally become very hard and quick; the pain is now intense; the patient exceedingly restless; twitchings of the tendons occur to a greater or less degree; on some occasions, a locked jaw and other convulsive affections supervene: and all these symptoms continuing to increase, it most frequently happens that the torture under which the patient has been groaning, is at last terminated by death.

Different opinions have prevailed respecting the cause of these symptoms. By some they have been imputed to wounds of the tendons: by others, the tendons are supposed to be so entirely destitute of sensibility, as to be quite incapable of producing so much distress; so that wounds of the nerves, they consider, on all such occasions, as the true cause of the various symptoms we have mentioned.

One or other of these ideas continued to be the only source for explaining the various phenomena found to occur in this malady, till a different opinion was suggested by the late ingenious Mr. John Hunter. This writer supposes, that all the dreadful symptoms found now and then to be induced by the operation of blood-letting, may be more readily accounted for from an inflamed state of the internal surface of the vein, than from any other cause. Such a state of the vein he often traced in horses that died of such symptoms from venesection; and the same appearances have sometimes occurred also in a human body. On other occasions, inflammation having in this manner been once excited, has been known to terminate in suppuration; and the matter thus produced being, in the course of circulation, carried to the heart, Mr. Hunter supposes that, in such cases, death may have been induced by that cause alone.

There can be no reason to doubt the fact held forth by Mr. Hunter, that, in such instances, the vein in which the orifice has been made, has frequently, after death, been found greatly inflamed: but however ingenious his arguments may be for concluding that the state of the vein is the original cause of all the bad sypmtoms enumerated; and, although we must allow that such an inflammatory

affection of a vein must have a considerable influence in aggravating the various symptoms previously induced by other causes; yet we may very fairly conclude, that it could not probably, in any one instance, be sufficient to account with satisfaction for their first production.

In many instances the patient, at the very instant of the operation, feels a very unusual degree of pain. In some cases, the violence of the pain is almost insupportable. Now, this we can never suppose to have been produced by the mere puncture of a vein; for although the coats of veins are not, perhaps, entirely destitute of feeling, yet we know well that they are not endowed with such a degree of sensibility as to render it probable such intense pain could ever be induced by their being punctured in any way whatever. This inflamed state of the veins, therefore, as detected by Mr. Hunter after death, must be considered rather as being produced by, than as being productive of, such affections: and that such ailments should frequently produce an inflammation of the contiguous veins, is a very probable conjecture. In the course of forty-eight hours or so from the operation, when the febrile symptoms are just commencing, such a degree of hardness and evident inflammation is induced over all the parts contiguous to the orifice, that it would be surprising indeed if the vein, which is thus, perhaps, entirely surrounded with parts highly inflamed, should escape altogether. We shall therefore proceed upon the supposition of this inflamed state of the veins being a consequence rather than the cause of such ailments; and, of course, we now revert to one or other of the opinions long ago adopted on this subject, that all the train of bad symptoms found on some occasions to succeed venesection, proceed either from the wound of a nerve or of a tendon.

That a partial wound of a nerve will now and then produce very distressing symptoms, no practitioner will deny: but it has been attempted to be shown, that tendons are almost totally destitute of sensibility; and it has, therefore, been supposed, that their being wounded can never account for the various symptoms known to occur in such cases. There is great reason, however, to think, that, in different instances, the same train of symptoms have been induced by different causes; that in one instance a wounded nerve, and in others pricks of the tendons, have occasioned them, as we have already supposed.

We shall now describe the method of curing the wound. In order to prevent, as much as possible, the consequent inflammation and other symptoms which usually ensue, a considerable quantity of blood should be immediately discharged at the orifice just made: the limb, for several days at least, ought to be kept in a state of perfect rest, care being at the same time taken to keep the muscles of the part in as relaxed a state as possible: the patient should be kept cool; on a low diet; and, if necessary, gentle laxatives ought to be administered.

When, notwithstanding these means, the symptoms, instead of diminishing, rather become more violent; if the lips of the orifice turn hard and more inflamed, if the pain becomes more considerable, and especially if the swelling begins to spread, other remedies come then to be indicated. In this state of the complaint, topical blood-letting, by means of leeches, applied as near as possible to the lips of the wound, frequently affords much relief; and, when the pulse is full and quick, it even becomes necessary to evacuate large quantities of blood, by opening a vein in some other part.

The external applications usually employed in this state of the complaint are warm emollient fomentations and poultices. In similar affections of other parts, no remedies with which we are acquainted would probably be found more successful, but in the complaint now under consideration, all such applications, instead of being productive of any advantage, rather do harm. The heat of the part is here one of the most distressing symptoms; and warm emollient applications rather tend to augment the source of uneasiness. The lips of the wound, also, are rendered still more hard, swelled, and of course more painful; and the swelling of the contiguous parts is increased. The best external remedies are cooling astringent applications. The parts chiefly affected being covered over with cloths, wet with very cold water, or a solution of vitriolated zinc, and Goulard's cerate on lint applied next the wound, are kept more cool and easy than by any other remedy. The febrile symptoms which occur must at the same time be attended to, by keeping the patient cool, on a low diet, preserving a lax state of the bowels; and, if necessary, farther quantities of blood ought to be evacuated.

On account of the violence of the pain, which is sometimes so excessive as to destroy entirely the patient's rest, opiates ought to be freely exhibited; and when twitchings of the tendons and other convulsive symptoms supervene, medicines of this kind become still more necessary. In order, however, to have a proper influence in this state of the complaint, opiates ought to be given in very full doses; otherwise, instead of answering any good purpose, they constantly tend to aggravate the different symptoms, not only by increasing the heat and restlessness, but by having an evident influence in rendering the system more susceptible than it was before, of the pain and other distressing effects produced upon it by the wound

It often happens, however, either from neglecting the wound or from improper treatment, that all these remedies are had recourse to without any advantage whatever; the fever, pain, and swelling

of the parts continuing, convulsive affections of the muscles at last occur, all tending to indicate the most imminent danger. In this situation of things, if we have not immediate recourse to some effectual means, the patient will soon fall a victim to the disorder; and the only remedy from which much real advantage is to be expected, is a free and extensive division of the parts in which the orifice producing all the mischief was at first made. We know well, from the repeated experience of ages, that much more pain and distress of every kind is usually produced by the partial division either of a nerve or of a tendon, than from any of those parts being at once cut entirely across. Now the intention of the operation here recommended, is to produce a complete division of the nerve or tendon we suppose to have been wounded by the point of the lancet, and which we consider as the sole cause of all the subsequent distress.

This operation being attended with a good deal of pain, and being put in practice for the removal of symptoms from which it is, perhaps, difficult to persuade the patient that much danger can occur, all the remedies we have mentioned should be first made trial of before it is proposed: but, at the same time, care ought to be taken that the disorder is not allowed to proceed too far before we have recourse to it; for, if the patient should be previously much weakened by the feverish symptoms having continued violent for any length of time, neither this remedy, nor any other with which we are acquainted, would probably have much influence. So soon, therefore, as the course already prescribed has been fairly tried, and is found to be inadequate to the effects expected from it, we ought immediately to have recourse to a free division of the parts chiefly affected, by which means the urgent symptoms will gradually subside, and the patient obtain a cure. By this operation we should endeavour to divide the nerve entirely, by making a pretty deep incision in the flesh a little above the wound made in blood-letting. There have been instances where the most violent symptoms have been suddenly relieved, by an incision across the arm, and that not a very deep one. This shows evidently, that, in these cases, the malady has been occasioned by the partial division of a nerve. The difficulty of finding out the nerve so affected, however, renders this operation somewhat more difficult, and even dangerous, than it would otherwise be, and therefore the following directions for the performance of it will be necessary.

Having provided against any accident from the division of the artery, by applying the tourniquet, make an incision in the external integuments, so large, that you are sure the wounded nerve or tendon must be within it: then gradually and cautiously make slight and shallow incisions in the cellular and muscular substance, until the wounded nerve is fairly cut through; taking all possible care to avoid the larger veins, arteries, and tendons. In this manner we must proceed, if the patient is not relieved sooner, till we arrive at the periosteum itself. If the patient, even by this severe incision, finds no relief, the tendon next to the wounded vein must be divided also; but there is no instance on record where such a division has been necessary; and this renders it probable, that the symptoms which have been enumerated proceed most frequently, if not always, from the wound of a nerve.

As the subject of this article is of no small importance, it is highly necessary to notice the opinions of the latest writers on the subject. Mr. Abernethy, one of the surgeons of St. Bartholomew's hospital, in London, in one of his surgical essays, after noticing the confused and general way in which most of those who have written on it, have treated the subject, lays down the *several distinct causes* from which mischiefs from phlebotomy may arise. These are,

1. *Inflammation of the integuments, and of the subjacent cellular substances.*—"The inflammation, and suppuration of the cellular substance," says he, "in which the vein lies, is the most frequent occurrence. Of this every surgeon must have seen repeated instances; they may also have remarked, that on the subsidence of this inflammation the tube of the vein is free from induration: neither does the state of any of the surrounding parts, indicate their previous participation in the disease. The nature of every excited inflammation will vary as the cause which produced it, and the constitution of the patient determine, it will therefore be unnecessary to particularly notice the varieties of its appearance. Sometimes the inflammation will be more indolent, and will produce a circumscribed, and suppurating tumor. Sometimes it will be more diffused, partaking more of the nature of erysipelas: and sometimes its violence, and rapid termination, will evidently distinguish it to be a phlegmon.

"If the lancet with which the patient was bled, should have been bad; if it lacerated rather than cut the parts through which it passed; if the constitution of the patient be irritable; and more particularly, if sufficient attention be not paid to procure the union of the divided parts, but the motion of the arm be allowed; the irritation, which the friction of the opposite edges of the wound must occasion, will most probably excite inflammation." The treatment proper to be pursued in this complaint is manifest, and distinguished by no peculiarity; Mr. A. therefore postpones what he had to say on that subject, until he has noticed the other varieties of these diseases.

2. *Inflammation of the absorbing vessels.*—"The

next frequent complaint, which I have seen, is inflammation of the absorbents: it however sometimes accidentally happens, that one surgeon meets with many cases of a similar nature, so that were he to judge merely from his own observation, he might conclude that disease to be common, when the collected experience of others would determine it to be a rare occurrence." Mr. A. says he is inclined to suspect, that his observation has been thus partial, since Mr. Hunter has not publicly noticed this complaint. The author relates from recollection, three cases of mischief from this cause.

"Physiology shews to us," says he, "that *the absorbents possess much sensibility*: their rejection of one kind of air, which is not evidently acrid, and their ready absorption of another, in my opinion, proves them to be endued with no slight degree of sensation. Practical observation further strengthens this opinion: the celerity with which these vessels inflame, when they have imbibed noxious matter, and the pain which is suffered in consequence, sufficiently prove this circumstance. Their frequent inflammation in consequence of disturbance of the general constitution, may be however regarded as an additional argument. A common cold produces a painful tumefaction of their glands; and in some fevers these parts are particularly obnoxious to disease.

"There is another circumstance which deserves attention: when the absorbents become inflamed, they quickly communicate this disease to the cellular substance by which they are surrounded. Most surgeons have remarked these vessels, when indurated, to appear like small chords, perhaps of one-eighth of an inch in diameter; this substance is surely not the slender sides of the vessel thus sudddenly augmented in bulk, but an induration of the surrounding cellular substance to which the irritated vessel has communicated inflammation. The formation of a common bubo is another instance of the power which these vessels possess of involving the surrounding parts in their disease: at first, one or two glands are found to be inflamed; but they soon become undistinguishable in the general inflammation of the surrounding substance. This inflammation either is dispersed, or it terminates in suppuration: and on the subsidence of the general tumor the originally diseased glands again become noticeable. Those frequently enormous tumors which form by the side of the neck, further confirm the observation: enquire into the origin and progress of the disease, and it will be found that one or two glands were at first affected, and that the disease extended itself to the surrounding substance, of which the greatest part of the swelling is composed. This remark must be taken with some limitation, for the glands of the neck do frequently enlarge to a considerable degree, without the surrounding cellular substance partaking of the disease; yet in such cases their growth is very gradual, and unaccompanied with active inflammation. Such are the reasons which induce me to suppose these vessels to be very sensible and irritable; and to possess a power of readily communicating disease to the cellular substance in which they lie."

Mr. Abernethy next endeavours to shew that their inflammation, in consequence of local injury, is *deducible* from *two causes*: "one, the absorption of acrid matter; and the other, the effect of irritation of the divided tube. Of the inflammation arising from the absorption of morbiferous matter every one is apprised, but that which is the effect of irritation has been less remarked.

"When virulent matter," says the author "is taken up by the absorbents, it is generally conveyed to the next absorbent gland; where its progress being retarded, its stimulating properties induce inflammation, and frequently no evident disease of the vessels through which it has passed can be distinguished. The absorption of syphilitic and cancerous matter affords frequent proofs of this assertion. Thereare, indeed, some poisons so acrid, that the vessel which admits them, inflames throughout its whole extent; yet still the glands are principally affected. When inflammation of the absorbents happens in consequence of irritation, that part of the vessel nearest the irritating cause generally suffers most; whilst the glands, being remotely situated, partake less of the inflammation. *The inflammation is also of a different kind*, and, I think, can be discriminated: when it arises from poison resident in the part, the gland is first indurated, and a phlegmonoid inflammation follows; but if irritation be the cause of its enlargement, the tumefaction more speedily takes place; the gland is more painful in its early state, but has less tendency to suppurate; the enlargement more resembles that of the lymphatic glands of the neck, which is the consequence of taking cold.

"When the inflammation arises from *irritation* it will be expected, and I believe it will be found, that the continuity of the vessel will be apparent: but it does not follow that the greatest disease will be immediately adjoining that part which has sustained the injury. The cases which have been related shew that inflammatory tumors often form in the middle of the arm, and fore-arm; when the wound of the absorbent is at the bend of the elbow. Were it necessary, I could relate several cases where such tumors formed from injuries done to the fingers, or in consequence of fretting ulcers of the leg. When they arise from the latter cause it might be supposed that some acrid matter had been imbibed, yet I think in that case, we should find the glands the principal seat of the disease. It has been proved that the absorbents frequently inflame

far below the part where the vessel has sustained an injury, and where the inflammation could not be occasioned by absorption. These observations I thought it right to insert, to illustrate the cases which have been related; and also to excite more general attention to the diseases of these important vessels."

3. *Inflammation of the vein.* After a concise account of Mr. Hunter's opinion, which we have already given, Mr. Abernethy says, "I have seen but three cases where an inflammation of the vein succeeded to venesection; they, however, confirm the foregoing observations. The vein did not in either case evidently suppurate. In the first, about three inches of the venal tube inflamed both above and below the orifice; it was accompanied with much tumor, redness, and pain of the covering integuments, and much fever; the pulse was rapid, and the tongue furred. After the inflammation had terminated, and all tumor had subsided, the vein did not swell, when compression was made above the diseased part. The second case was of a similar nature, but less in degree. In the third case the inflammation was not continued in the course of the vein towards the heart, but extended as low as the wrist. I have no doubt, but that adhesion of the sides of the vein was the cause which prevented the extension of the disease equally in both directions. The nature of a disease being known, the treatment is commonly evident. The diminution of inflammation in a vein is to be attempted by the same general means as in other parts. As the membranous lining of the vein is continued to the heart, and as inflammation is very speedily extended along such surfaces, unless prevented by adhesion, the application of a compress at some distance from the punctured part, in order to unite the inflamed sides of the vein, appears to be particularly judicious.

"I am induced to suppose a case may occur in which *the vein may suppurate*, and in which a total division of the tube may be proper practice; not merely to obviate the extension of the local disease, but to prevent the mixture of collected pus with the circulating fluids."

4. *Inflammation of the fascia of the fore-arm.* "As far as my observation hath extended," says Mr. Abernethy "the next frequent ill consequence which succeeds to venesection, performed in the arm, is an inflammation of the *subjacent fascia.* When this complaint occurs, it perhaps arises not merely from the contiguity of the fascia to the punctured and irritated parts, but it is probable that it was wounded by the lancet in the operation." Sufficient information of the symptoms, and effects of this disease, are conveyed in th following instances:

"A man, 40 years of age, was admitted into St. Bartholomew's hospital, under the care of Mr. Pott: he had much pain and difficulty in moving his arm, in consequence of inflammation succeeding to phlebotomy. The wound inflicted in that operation was not healed; the surrounding integuments were not much inflamed, but he could neither extend his fore-arm nor his fingers without great pain. The integuments of the fore-arm were affected with a kind of erysipelas; when slightly touched they were not very painful, but when more forcibly compressed, so as to affect the inferior parts, much pain was suffered. The patient complained of pain extending towards the axilla, and also towards the acromion; but no tumor of the arm, in either direction, was perceptible. A poultice was applied to the arm, opium was given at night, and aperient medicines were occasionally prescribed. The pain in the arm increased, and it was attended by much fever. After a week had elapsed, a small and superficial collection of matter took place a little below the internal condyle; this being opened, but little pus was discharged: and scarcely any decrease of tumor or pain followed. About ten days afterwards a fluctuation of matter was distinguished below the external condyle; an incision was here also made, which penetrated the fascia of the fore-arm. Much matter immediately gushed from the wound, the swelling greatly subsided, and the future sufferings of the patient were comparatively of little consequence. This opening was, however, inadequate to the complete discharge of the matter; which had probably been originally formed beneath the fascia, in the course of the ulna: its pointing at the upper part of the arm depended on the tenuity and comparative non-resistance of the fascia at that part. The collected pus descended to the lower part of the detached fascia; a depending opening for its discharge became necessary, after which the patient recovered without any circumstance being observed worthy of relation. The case which I have just related, and that in which two large abscesses had formed, attended with indurated absorbents, occurred nearly at the same time at the hospital, and they both fell under the care of Mr. Pott. In the lectures of that eminent surgeon, I had heard dangerous and fatal consequences attributed to the injury of a nerve in venesection, but I learned no other distinction of cases. These cases first excited my attention to this subject, and, as far as I know, such discrimination as that which I now offer to the public has not been attempted."

The author here speaks of another case of inflamed fascia, in which no inflammation of the vein or absorbents appeared. "The integuments were not much affected, but the patient complained that his arm felt as if bound or compressed, and that he suffered much pain if he attempted to extend it. The inflammation subsisted without the formation

of matter; and after much time had elapsed, the pliability of the arm was gradually regained."

In the second volume of the Medical Communications, two cases of inflammation of the *fascia*, attended, however, with some peculiarity of symptoms, may be found.

"The *treatment* of an inflamed fascia," says Mr. Abernethy, "the consequence of venesection, has in it no peculiarity. Doubtless those general means which are reductive of inflammation should be employed. Of local treatment, quietude of the limb, and a state of relaxation of the inflamed part, will tend to lessen disease; but as soon as some abatement of inflammation is procured, the extension of the fore-arm and fingers ought to be attempted, and daily performed, to obviate that contraction which might otherwise ensue."

5. *The ill consequences succeeding to a wounded nerve* come next under Mr. Abernethy's consideration. By delineations annexed to his Essay, he shews, that if the patient be bled in the *vena mediana basilica*, the branches of the *internal cutaneous nerve* are exposed to injury: or if the *vena mediana cephalica* be opened, the branches of the *external cutaneous nerves* may be wounded. This part of the subject, however, we refer to the article NERVES.

BLEEDING, TOPICAL, that species of blood-letting which is designed to have a local effect. When, either from the severity of a fixed pain in a part or from any other cause, it is wished to evacuate blood directly from the small vessels of the part affected, instead of opening any of the larger arteries or veins, the following are the different modes proposed for effecting it, viz. by means of leeches; by slight scarifications with the shoulder or edge of a lancet; and, lastly, by means of a well-known instrument termed a *scarificator;* in which sixteen or twenty lancets are commonly placed, in such a manner, that, when the instrument is applied to the part affected, the whole number of lancets contained in it are, by means of a strong spring, pushed suddenly into it, to the depth at which the instrument has been previously regulated. This being done, as the smaller blood-vessels only by this operation are ever intended to be cut, and as these do not commonly discharge freely, some means or other become necessary for promoting the evacuation.

Various methods have been proposed for this purpose. *Glasses* fitted to the form of the affected parts, with a small hole in the bottom of each, were long ago contrived; and these being placed upon the scarified parts, a degree of suction was produced by a person's mouth sufficient for nearly exhausting the air contained in the glass: and this accordingly was a sure enough method of increasing the evacuation of blood to a certain extent. But as this was attended with a good deal of trouble, and besides did not on every occasion prove altogether effectual, an exhausting syringe was at last adapted to the glass, which did indeed answer as a very certain method of extracting the air contained in it; but the application of this instrument for any length of time is very troublesome, and it is difficult to preserve the syringe always air-tight.

The application of heat to the *cupping-glasses*, has been found to rarefy the air contained in them to a degree sufficient for producing a very considerable suction; and as the instrument in this simple form answers the purpose in view with very little trouble to the operator, and is to be at all times easily obtained, the use of the syringe has therefore been laid aside.

There are different methods adopted for thus applying heat to the cavity of the glass. By supporting the mouth of it for a few seconds above the flame of a taper, the air may be sufficiently rarefied; but if the flame is not kept exactly in the middle, but is allowed to touch either the sides or bottom of the glass, it is very apt to make it crack. A more certain, as well as an easier, method of applying the heat, is to dip a piece of soft bibulous paper in spirit of wine; and having set it on fire, to put it into the bottom of the glass, and, on its being nearly extinguished, to apply the mouth of the instrument directly upon the scarified part. This degree of heat, which may be always regulated by the size of the piece of paper, and which it is evident ought to be always in proportion to the size of the glass, if long enough applied, proves always sufficient for rarefying the air very effectually, and at the same time, if done with any manner of caution, never injures the glass in the least.

The glass having been thus applied, if the scarifications have been properly made, they instantly begin to discharge freely: and so soon as the instrument is nearly full of blood, it should be taken away; which may be always easily done by raising one side of it, so as to give access to the external air. When more blood is wished to be taken, the parts should be bathed with warm water; and being made perfectly dry, another glass, exactly the size of the former, should be instantly applied in the very same manner: and thus, if the scarificator has been made to push to a sufficient depth, so as to have cut all the cutaneous vessels of the part, almost any necessary quantity of blood may be obtained. It sometimes happens, however, that the full quantity intended to be discharged cannot be got at one place. In such a case, the scarificator must be again applied on a part as contiguous to the other as possible; and this being done, the application of the glasses must also be renewed as before.

When it is wished to discharge the quantity of blood as quickly as possible, two or more glasses

may be applied at once on contiguous parts previously scarified; and, on some occasions, the quantity of blood is more quickly obtained by the cupping-glasses being applied for a few seconds, upon the parts to be afterwards scarified. The suction produced by the glasses may possibly have some influence in bringing the more deep-seated vessels into nearer contact with the skin, so that more of them will be cut by the scarificator.

A sufficient quantity of blood being procured, the wounds made by the different lancets should be all perfectly cleared of blood; and a bit of soft linen, dipped in a little milk or cream, applied over the whole, is the only dressing that is necessary. When dry linen is applied, it not only creates more uneasiness to the patient, but renders the wounds more apt to fester than when it has been previously wetted in the manner directed.

When the part from which it is intended to produce a local evacuation of this kind is so situated, that a scarificator and cupping-glasses can be applied, this method is greatly preferable to every other; but in inflammatory affections of the eye, of the nose, and of other parts of the face, &c. the scarificator cannot be properly applied directly to the parts affected. In such instances, *leeches* are commonly had recourse to, as they can be placed upon almost any spot from whence we would wish to discharge blood.

In the application of these animals, the most effectual method of making them fix upon a particular spot, is to confine them to the part by means of a small wine-glass. Allowing them to creep upon a dry cloth, or upon a dry board, for a few minutes before application, makes them fix more readily; and moistening and cooling the parts on which they are intended to fix, either with milk, cream, or blood, tends also to make them adhere much more speedily than they otherwise would do. So soon as the leeches have separated, the ordinary method of promoting the discharge of blood, is to cover the part with linen cloths wet in warm water. In some situations, this may probably be as effectual a method as any other; but wherever the cupping-glasses can be applied over the wounds, they answer the purpose much more effectually.

BLENDE, false galena, a species of the ore of *zinc:* it is always of a glaring appearance; is mineralized by sulphur, and often contains iron.

BLENNORRHA'GIA, (from βλεννα, *mucus*, and ῥεω, *to flow*). The name *gonorrhœa* implies a discharge of semen; which never takes place in the complaint to which at present it is applied; and, for which, if a Greek name is to be retained, Dr. Swediaur proposes to call it *blennorrhagia*, i. e. *mucifluxus, (activus);* and thus, to distinguish both from real gonnorrhœas, and from gleets, to which latter he proposes to give the name *blennorrhœa*, *mucifluxus (passivus)*, i. e. without inflammatory symptoms.

BLENNORRHA'GIA BA'LANI. Dr. Swediaur proposes this name as more properly expressive of the disorder called *gonorrhœa spuria*, which see. The disorder is an active discharge from the part.

BLENNORRHŒA, (βλεννορροια; from βλεννα, *mucus*, and ῥεω, *to flow*); *Gonorrhœa mucosa*, or gleet. An increased discharge of mucus from the urethra, arising from topical weakness.

BLEPHA'RIDES, (from βπεφαρον, *an eyelid)*, the hairs on the edges of the eyelids; also that part of the eyelids themselves on which the hairs grow.

BLEPHAROPHTHA'LMIA, (βλεφαροφθαλμια; from βλεφαροι, *the eyelid*, and οφθαλμος, *the eye*), an inflammation of the eyelid.

BLEPHAROPTO'SIS, (βλεφαροπτωσις; from βλεφαρος, *the eyelid*, and πτωσις, from πιπτω, *to fall)*; a prolapsion, or falling down of the upper eyelid, so as to cover the cornea. It generally arises from a loss of power in the muscle which elevates the eyelid, and is to be cured by electricity, with the application of camphor and other topical stimulants.

BLESSED THISTLE. See CARDUUS BENEDICTUS.

BLITUM FŒTIDUM. See ATRIPLEX FŒTIDA.

BLOOD, a red liquor circulating through the vessels of the human body and the bodies of the larger animals, which is immediately and essentially necessary to existence.

Though there is no living creature as yet known whose life does not immediately depend upon the circulation of some kind of fluid through its vessels, yet unless such fluid is of a red colour, it does not obtain the name of *blood;* and therefore such creatures as have a colourless or milky liquor circulating through their vessels, are called *exsanguious animals.*

The *blood*, on a loose examination, appears homogeneous, or of similar parts, red, and coagulating throughout; and is observed to be redder in proportion to the strength of the animal: in a weak and famished one, the blood inclines to a yellow: it has a whiteness observable in it, which arises almost totally from the chyle. But from various experiments it is found that this animal liquor contains very different ingredients.

That caloric is contained in the blood may be proved from its temperature. This in human blood, and that of some other animals, is from 92 to 100 degrees of Fahrenheit's thermometer, which is more than the mean degree of atmospherical heat, but less than the greatest. It is also certain that the degree of heat in the body increases a little from an augmentation of heat in the atmosphere; but it does not rise to the greatest pitch of summer heat. We can live in a much greater heat than the heat of the warmest summer, as is proved by persons in sugar-houses, melting-furnaces, glass-houses, &c.

from the use of baths and stoves in Finland and Russia; and also by the late experiments of Fordyce, Blagden, Hunter, and Dobson. The heat of the blood is sometimes so diminished in an intense cold, that in a person frost-bitten, but not dead, a thermometer applied to the mouth, arm-pits, groins, and even the vagina, would not rise above 76° of Fahrenheit. Is the matter of heat in the blood alone? This is sufficiently probable from phenomena; for the heat of the body is diminished by hemorrhagy, or when the blood is intercepted by ligature and compression from reaching the joints, and is restored when the blood returns. Mr. Fyffe observes, however, that his experiments on living animals, particularly upon swine, did not discover so great a difference as might have been expected, between the heat of the heart, arteries, veins, brain, stomach, intestines, tunica vaginalis, and even the interstices of the cellular texture in the muscles. Again, a kind of volatile vapour or exhalation continually flies off from the warm blood, which has a sort of fœtid smell, intermediate between that of the sweat and urine.

After this vapour has been dissipated, the blood of a healthy person spontaneously congeals into a scissile, trembling mass, especially in a heat of about 150 degrees, and sooner in feverish persons than in such as are in health. It sometimes coagulates in the veins of a living person, and is found clotted in wounds of the arteries. But even within the vessels of a person dying of a violent fever, the blood has been said to change into a concreted tremulous jelly throughout all the veins; this, however, it is difficult to conceive.

Chemistry has, in various ways, shewn us the nature of the blood. 1. When fresh drawn, before it has time to putrify, the blood, distilled with a slow heat, yields a *water* to the quantity of five parts in six of the whole mass; which water has little or no taste or smell, till towards the end of the operation, when it is proportionally more charged with a fœtid oil. 2. The residuum, exposed to a stronger fire, yields various alkaline liquors, of which the first, being acrid, fœtid, and of a reddish colour, has been called the *spirit* of blood; it consists of a volatile salt, with some little oil, dissolved in water, to the amount of one-twentieth part of the original mass of blood. This same acrimonious substance is observable in the fat, and likewise in putrid flesh and blood. 3. A little before, and together with the oil, some *volatile salt* arises, and adheres in branchy flakes to the neck and sides of the glass. The quantity of this salt is very small, being less than an eightieth part of the whole mass. 4. The next product is *oil*, that is at first yellow, afterwards black, and at last resembling pitch, being very acrid and inflammable: it makes about a fiftieth part of the whole mass. 5. There remains in the bottom of the retort a spongy inflammable coal or cinder, which, being kindled, burns and leaves ashes behind. From these ashes, by lixiviation with water, is obtained a *mixed salt*, partly sea-salt, and partly fixed alkali, together with a small quantity of earth. This salt is scarcely the five hundredth part of the mass, and of this only one fourth part is alkaline: but being calcined with an intense fire, the whole salt affords some portion of *an acid;* which we suppose to be chiefly owing to the sea-salt in the blood. See Prussic Acid.

From the preceding analysis of the blood, it evidently contains a variety of particles, differing in bulk, weight, figure, and tenacity; some watery, others inflammable, and most of them greatly inclined to putrefaction, and of an alkaline nature. The blood, in a sound healthy state, not injured by putrefaction, or too violent a degree of heat, is neither alkaline nor acid, but mild or gelatinous, and a little saltish to the taste; yet, in some diseases it is very acrid, and comes near to a state of putrefaction; as for instance, in the scurvy, where it corrodes its containing vessels; and in dropsies, the waters of which are frequently alkaline. But an alkalescent calx is found in the blood of insects, which effervesces with acids.

By a microscope we perceive in the blood red globules; which, doubtless, make that part called *cruor* or *crassamentum.* If it be questioned, whether these are not rather lenticular particles of the same kind with those observed by Lewenhoek in fish, and since discovered in our own species, we confess it is a point difficult to determine; Hewson, however, observes that the particles are flat like a guinea, as we shall presently see.

The colour of these globules is red; and the intenseness of their colour, and the proportion they bear to the whole mass, increases with the strength of the animal. Their diameter is very small, being between $\frac{1}{2000}$ and $\frac{1}{3000}$ of an inch. They are said to change thier figure into an oblong egg-like shape, which Haller could never observe with sufficient certainty. They are also said to dissolve into other lesser globules of a yellow colour, which he had neither observed himself, nor could easily admit.

From the red part of the blood, fibres of *coagulable lymph* are generated in abundance; and from the serum, in smaller quantities. They are procured by pouring the blood into a linen-cloth, and washing it gradually with a great deal of water, or by beating it with a rod. In quantity, they equal the 28th part of the whole mass. These are formed of the gluten, and are not generated in a living animal; since they are neither to be perceived by the microscope, which so easily renders visible the red globules; nor yet does their long thread-like figure seem adapted for receiving motion.

From the preceding experiments compared together arises that knowledge which we at present

have of the blood ; namely, that the *crassamentum* or *cruor* is composed of globules. The inflammable or combustible nature of these globules is proved from dried blood, which takes flame and burns ; as also from the pyrophorus, which is prepared from the human blood : and from globules also most probably arises the greater part of the empyreumatic oil that is obtained from blood by applying a sufficient degree of heat.

The serum of the blood distilled with a strong fire gives over almost the same principles with the crassamentum, viz. salt, oil, and earth. It yields, however, much more water, but no iron at all. Similar principles, but with a less proportion of oil and salt, are obtained from the aqueous humours prepared from the blood, as the saliva and mucus.

The exact mass or quantity of blood contained in the whole body cannot be certainly computed. The weight of the mass of humours, however, is much greater than that of the solids ; but many of them, as the gluten and fat of particular parts, do not flow in the circulation. But, if we may be allowed to form a judgment from those profuse hæmorrhagies that have been sustained without destroying the life of the patient, and from experiments made on living animals by drawing out all their blood, the mass of circulating humours will be at least fifty pounds ; of which, about 28 will be true red blood, running in the arteries and veins ; of which the arteries contain only four parts, and the veins nine.

The blood does not always contain the same proportion of the principles abovementioned : for an increased celerity, whether by laborious and strong exercises, a full age, fever, or otherwise, augments the crassamentum, the redness, the congealing force, and the cohesion of the particles ; and the hardness and the weight of the concreted, serum with the alkaline principles, are increased by the same means. On the other hand, the younger and less active animal, and the more watery or vegetable the diet on which it is fed, the crassamentum of the blood is proportionally lessened, and its serum and mucus increased. Old age, again, lessens the crassamentum, and the gelatinous part likewise.

From these principles, and a due consideration of the solid fibres and vessels, the different temperaments are derived. (See Temperament.) For a *plethoric* or *sanguine* habit arises from an abundance of the red globules ; a *phlegmatic*, from a redundancy of the watery parts of the blood, &c. and in the *melancholic*, a weakness of the solids is joined with the highest degree of nervous irritation or sensibility.

The coagulable parts of the blood seem to be more especially designed for the nutrition of the animal, whilst the thinner juices serve various purposes, as the dissolution of the aliments, the moistening of the external surface of the body, and surfaces of the external cavities, to preserve the flexibility of the solids, and conduce to the regular functions of the nerves, &c. The saline particles seem serviceable for stimulating the vessels. The properties of the aerial part are not yet decidedly known, though the opinions of some eminent men on the subject are stated in the article Animal Heat. The heat, at least, occasions the blood's fluidity, and is not capable of being raised to such a degree as to coagulate the humours in the living body.

Health, it is plain, cannot subsist without a dense and red blood ; and, if its quantity be too much diminished, a stagnation of the juices takes place, whence the whole body becomes pale, cold, and weak. Nor can life or health subsist without a sufficiency of thinner juices intermixed with the red blood ; since the cruor, deprived of its watery part, would congeal and obstruct the smallest passages of the vessels.

It is now sufficiently known that there exists a striking difference between the arterial and venous blood, on account of the former's having lately suffered the action of the lungs. Accordingly, the bright red colour of the arterial blood forms a contrast with the dusky dark-coloured blood in the veins ; and this brightness of tint it derives from the absorption of the oxygen of the atmosphere in the act of respiration. See Animal Heat.

From Mr. Hewson's, microscopical experiments on the blood, the latest that have appeared, we shall transcribe the following particular account, given by himself in a letter to Dr. Haygarth.

" Instead," says he, " of calling this part red *globules*, I should call it red *vesicles ;* for each particle is a flat vesicle, with a little solid sphere in its centre.

" I find that the blood of all animals contains vesicles of this sort. In human blood there are millions of them ; and they give it the red colour. But in insects they are white, and less numerous in proportion than in man and quadrupeds. As they are flat in all animals, I suspect that shape is a circumstance of importance, but can be altered by a mixture with different fluids. And I find that it is by a determinate quantity of neutral salt, contained in the serum, that this fluid is adapted to preserving these vesicles in their flat shape ; for, if they be mixed with water, they become round, and dissolve perfectly ; but add a little of any neutral salt to the water, and they remain in it, without any alteration in their shape, and without dissolving.

" Now, when it is considered that the blood of all animals is filled with these particles, we must believe that they serve some very important purpose in the animal economy ; and, since they are so complicated in their structure, it is improbable

they should be made by mechanical agitation in the lungs or blood-vessels, as has been suspected, but probably have some organs set apart for their formation. This I shall endeavour to prove, when I have explained their structure a little more particularly, and mention the manner in which I exhibit it. I take the blood of a toad or frog, in which they are very large; I mix it with the serum of human blood to dilute it; I find them appear all flat; so they do in the blood-vessels of this animal, as I have distinctly seen in the web between its toes, whilst the animal was alive, and fixed in the microscope. Their appearance in these animals is not unlike slices of cucumber. I next mix a little of the blood with water, which immediately makes them all round, and then begins to dissolve them whilst they are round. I incline the stage of the microscope, so as to make them roll down it; and then I can distinctly see the solid in the middle fall from side to side like a pea in a bladder. A neutral salt added to them at this time brings them back to their flat shape; but, if the salt be not added, the water gradually dissolves away the vesicle, and then the little sphere is left naked. Such is the composition of these particles. I have exhibited these experiments to a considerable number of my acquaintance, who all agree in their being satisfactory.

" The microscope I use is a single lens, and therefore as little likely to deceive us as a pair of spectacles, which, as is allowed by all who use them, do not disfigure objects, but only represent them larger.

" From farther experiments, I am convinced, that the use of the thymus and lymphatic glands is to make the middle solid pieces; and I can prove it in as satisfactory a manner as you can do the use of any viscus in the human body; that is, by opening these glands, and examining the fluid contained in their cells, which I find to be full of these little solids. I moreover find, that the lymphatic vessels take them up from those glands, and convey them into the blood-vessels, which carry them to the spleen, in whose cells they have the vesicles laid over them; so that the thymus and lymphatic glands make the central particles, and the spleen makes the vesicles that surround them. That this is the use of the spleen appears from examining the lymph which is returned from its lymphatic vessels; for that lymph, contrary to what is observed in other parts of the body, is extremely red.

" But, besides having these glands set apart for making the red vesicles of the blood, I find that they are also made in the lymphatic vessels in different parts of the body, whose coats have blood-vessels properly constructed for this secretion. So that the thymus and lymphatic glands are no more than appendages of the lymphatic system, for making the middle particles, and the spleen an appendage to the lymphatic vessels, for making the vesicles which contain these middle particles.

" I conjecture that it is the coagulable lymph which is converted into this red part of the blood, from a curious fact that has long been known; namely, that the blood in the splenic vein does not coagulate when exposed to the air, as the blood of other veins does; so that it seems to be robbed of its coagulable lymph in passing through the spleen.

" It is very remarkable, that the spleen can be cut out of an animal, and the animal do well without it. I made the experiment on a dog, and kept him a year and a half without observing his health to be in the least impaired. From this, some have concluded the spleen to be an useless weight; which is absurd, when we consider that all animals with red blood have it. Therefore, it is more consistent with what we know of the animal economy, to conclude, that, since an animal can do well without it, there is probably some part of the body that can supply its place.

" Insects have vesicles constructed in a similar way to ours, but differing in colour; but insects have neither spleen, thymus, nor lymphatic glands: and therefore in them probably these vesicles are entirely fabricated in the lymphatic vessels. But to us, and other of the more perfect animals, besides the lymphatic vessels, nature has given those glands, that a proper quantity of those important vesicles might be the better secured to us; just as she has given us two ears, the better to secure us hearing through life, though we can hear perfectly well with one."

This letter, we apprehend, contains the strength of Mr. Hewson's evidence for his hypothesis; on which we shall only remark, that if the red globules are prepared in the manner abovementioned, and the lymphatic vessels are excretories of those glands where the red particles are formed; then, if there is any vessel where all these excretories unite, in that vessel the lymph ought to appear very red, on account of the accumulated quantity of red globules brought thither from all parts of the body: but no such redness seems ever to have been taken notice of by any anatomist: this, therefore, must be an objection to Mr. Hewson's hypothesis, and such an one, perhaps, as will not be easily removed.

Many other hypotheses have been invented concerning the formation of the red blood, and various opinions delivered concerning its red colour. In a lecture, delivered at Newcastle in 1773, by Dr. Wilson of that place, he asserts, " that it is self-evidently the office of the veins to elaborate the fluids into that form and composition which we know by the name of *red blood*." The self-evidence here, however, is by no means apparent to us; nor does he at all point it out in an intelligible manner.—Dr. Cullen, in his physiological part of the Institutions of Medicine, acknowledges that we

know but little of the formation of any of the animal fluids: and, concerning the microscopical observations, &c. on the blood, gives his opinion in the following words, § ccliv.: "The red globules have been considered as an oily matter, and from thence their distinct and globular appearance has been accounted for: but there is no direct proof of their oily nature; and their ready union with, and diffusibility in, water, renders it very improbable. As being microscopical objects only, they have been represented by different persons very differently. Some have thought them spherical bodies, but divisible into six parts, each of which, in their separate state, were also spherical: but other persons have not observed them to be thus divisible. To many observers they have appeared as perfectly spherical; while others judge them to be oblate spheroids, or lenticular. To some they have appeared as annular; and to others as containing a hollow vesicle. All this, with several other circumstances relating to them, very variously represented, show some uncertainty in microscopical observations; and it leaves me, who am not conversant in such observations, altogether uncertain with respect to the precise nature of this part of the blood. The chemical history of it is equally precarious; and, therefore, what has been hitherto said of the production and changes happening to these red globules, we chuse to leave untouched. We suppose that the red globules, when viewed singly, has very little colour; and that it is only when a certain number of them are laid upon one another, that the colour appears of a bright red: but this also hath its limits; so that when the number of globules laid on one another is considerable, the colour becomes of a darker red. Upon this supposition, the colour of the mass of blood will be brighter or darker as the colouring part is more or less diffused among the other parts of the mass; and we think this appears to be truly the case, from every circumstance that attends the changes which have been at any time observed in the colour of the blood."

This leads us to consider the uses to which the blood is subservient in the animal economy, and the changes that happen to it in respiration. The uses of this fluid are so various, and of such an important nature, that some have not scrupled to affirm the blood to be actually possessed of a living principle, and that the life of the whole body is derived from it. This opinion was first broached by the celebrated Harvey, the discoverer of the circulation: but in this he was never much followed; and the hypothesis itself, indeed, has been laid aside and neglected, till some years ago that it was revived by the late Mr. John Hunter, of London. This illustrious man supports his opinion by the following arguments: 1. The blood unites living parts, in some circumstances, as certainly as the yet recent juices of the branch of one tree unite it with that of another. Were either of these fluids to be considered as extraneous or dead matters, he thinks they would act as stimuli, and no union would take place in the animal or vegetable kingdom. This argument, Mr. Hunter imagines, is still farther established by the following experiment: having taken off the testicle of a living cock, he introduced it into the belly of a living hen. Many weeks afterwards, upon injecting the liver of the hen, he injected the testicle of the cock; which had come in contact with the liver, and adhered to it. He alleges, that in the nature of things, there is not a more intimate connection between life and a solid, than between life and a fluid. For, although we are more accustomed to connect it with the one than the other, yet the only real difference which can be shown between a solid and a fluid is, that the particles of the one are less moveable among themselves than those of the other. Besides, we often see the same body fluid in one case and solid in another. 2. The blood becomes vascular like other living parts. Mr. Hunter affirms, that, after amputations, the coagula in the extremities of arteries may be injected by injecting these arteries; and he had a preparation in which he thought he could demonstrate vessels rising from the centre of what had been a coagulum of blood, and opening into the stream of the circulating blood. 3. Blood taken from the arm in the most intense cold which the human body can bear, raises the thermometer to the same height as blood taken in the most sultry heat. This he considers as a strong proof of the blood's being alive; as living bodies alone have the power of resisting great degrees both of heat and cold, and of maintaining in almost every situation, while in health, that temperature which we distinguish by the name of *animal heat.* 4. Blood is capable of being acted upon by a stimulus. In proof of this, he observes, that it coaguales from exposure, as certainly as the cavities of the abdomen and thorax inflame from the same cause. The more it is alive, that is, the more the animal is in health, it coagulates the sooner on exposure; and the more it has lost of its living principle, as in the case of violent inflammation, the less is it sensible to the stimulus produced from its being exposed, and it coagulates the later. 5. The blood preserves life in different parts of the body. When the nerves going to a part are tied or cut, the part becomes paralytic, and loses all power of motion; but it does not mortify. If the artery be cut, the part dies, and mortification ensues. What keeps it alive in the first case? Mr. Hunter believes it is the living principle which alone can keep it alive; and he thinks that this phenomenon is inexplicable on any other supposition, than that life is supported by the blood. 6. Another argument he draws from a case of a fractured os humeri he had occasion to observe. A man was brought into St. George's hospital for a simple fracture of the os humeri, and died about

a month after the accident. As the bones had not united, Mr. Hunter injected the arm after death. He found that the cavity between the extremities of the bones was filled up with blood which had coagulated. This blood was become vascular. In some places it was very much so. He does not maintain that all coagulated blood becomes vascular: and indeed the reason is obvious; for it is often thrown out and coagulated in parts where its becoming vascular could answer no end in the system: as, for example, in the cavities of aneurismal sacs. If it be supposed, that, in such cases as that just now mentioned, the vessels are not formed in the coagulum, but come from the neighbouring arteries, he thinks it equally an argument that the blood is alive; for the substance into which vessels shoot must be so. The very idea, that such a quantity of dead matter as the whole mass of blood, circulates in a living body, appeared to him absurd.

The system which at present stands opposed to that of Mr. Hunter, considers the brain and nervous system as the fountain of life; and that, so far from receiving its life from the blood, the nervous system is capable of instantaneously changing the crasis of the blood, or any other animal fluid; and though the nervous system cannot continue its actions for any length of time if the action of the blood-vessels is suspended, yet the heart and blood-vessels cannot act for a single moment without the influence of the nervous fluid. Hence, say they, it is plain we must suppose the nervous system, and not the blood, to contain properly the life of the animal, and consequently to be the principal vital organ. The secretion of the vital fluid from the blood by means of the brain, is, by the supporters of this hypothesis, denied. They say, that any fluid secreted from the blood must be aqueous, inelastic, and inactive; whereas the nervous fluid is full of vigour, elastic, and volatile in the highest degree. The great necessity for the circulation of the blood through all parts of the body, notwithstanding the presence of the nervous fluid in the same parts, they say is, because some degree of tension is necessary to be given to the fibres, in order to fit them for the influx of the nervous fluid; and this tension they receive from the repletion of the blood-vessels, which are every where dispersed along with the nerves.

To follow this dispute through every argument that has been, or that may be, used by both parties, would prove tedious, and to us appears in a great measure unnecessary, as the following short considerations seem to decide the matter absolutely against the patrons of the nervous system. In the first place, then, if we can prove the life of the human body to have existed in, or to have been communicated from a fluid to the nervous system, the analogical argument will be very strongly in favour of the supposition that the case is so still. Now, that the case was once so, is most evident; for the human body, as well as the body of every other living creature, in its first state, is well known to be a gelatinous mass, without muscles, nerves, or blood-vessels. Nevertheless, this gelatinous matter, even at that time, contained the nervous fluid. Of this there can be no doubt, because the nerves were formed out of it, and had their power originally from it; and what is remarkable, the brain is observed to be that part of the animal which is first formed. Of this gelatinous fluid we give no other account, than that it was the nutritious matter from which the whole body appears to be formed. At the original formation of man, and other animals, therefore, the nutritious matter was the substratum of the whole body, consisting of muscles, nerves, blood-vessels, &c. nay more, it was the immediate efficient cause of the nervous power itself. Why should it not be so now as well as then? Again, in the formation of the embryo, we see a vital principle existing, as it were, at large, and forming to itself a kind of regulator to its own motions, or a habitation in which it chuses to reside, rather than to act at random in the fluid. This habitation, or regulator, was undoubtedly the nervous system, and continues so to this moment; but at the same time, it is no less evident that a nutritious fluid was the immediate origin of these same nerves, and of that very nervous fluid. Now we know, that the fluid which in the womb nourishes the bodies of all embryo animals, is necessarily equivalent to the blood which nourishes the bodies of adult ones; and consequently, as soon as the blood became the only nutritious juice of the body, at that same time the vital or nervous fluid took up its residence there, and from the blood diffused itself along the nerves, where it was regulated exactly according to the model originally formed in the embryo. Perhaps it may be said, that the vital power, when once it has taken possession of the human or any other body, requires no addition or supply, but continues there in the same quantity from first to last. If we suppose the nervous power to be immaterial, this will indeed be the case, and there is an end of reasoning upon the subject; but if we call this power a volatile and elastic fluid, it is plain that there will be more occasion for recruits to such a power than to any other fluid of the body, as its volatility and elasticity will promote its escape in great quantities through every part of the body. It may also be objected, that it is absurd to suppose any fluid, or mechanical cause, capable of putting matter in such a form as to direct its own motions in a particular way: but even of this we have a positive proof in the case of the electric fluid. For if any quantity of this matter has a tendency to go from one place to another where it meets with difficulty, through the air for instance, it will throw small conducting substances before it, in order to facilitate its pro-

gress. Also, if a number of small and light conducting substances are laid between two metallic bodies, so as to form a circle, for example; a shock of electricity will destroy that circle, and place the small conducting substances nearer to a straight line between the two metals, as if the fluid knew there was a shorter passage, and resolved to take that, if it should have occasion to return. Lastly, it is universally allowed, that the brain is a secretary organ, made up of an infinite number of small glands, which have no other excretories than the medullary fibres and nerves. As a considerable quantity of blood is carried to the brain, and the minute arteries end in these small glands, it follows, that the fluid, whatever it is, must come from the blood. Now, there is no gland whatever, in the human, or any other body, but will discharge the fluid it is appointed to secrete, in very considerable quantity, if its excretory is cut. Upon the cutting of a nerve, therefore, the fluid secreted by the brain ought to be discharged; but no such discharge is visible. A small quantity of glairy matter is indeed discharged from the large nerves; but this can be no other than the nutritious juice necessary for their support. This makes it plain, even to demonstration, that the fluid secreted in the brain is *invisible* in its nature; and as we know the nervous fluid has its residence in the brain, it is very probable, to use no stronger expression, that it is the peculiar province of the brain to secrete this fluid from the blood, and consequently that the blood originally contains the vital principle. But in order that the subject may be better understood, we shall here introduce some passages from Mr. Hunter's great work on the blood and the nature of inflammation.

The various experiments which he made on living muscles, to see how far these contractions, after having been frozen, correspond with the coagulation of the blood, led him to conclude that there exists a similarity in the excitements of coagulation in the blood, and of contraction in muscles; and that both apparently depend on the same principle, namely, their *life*.

"If," says he, "it should still be difficult to conceive how a body in a fluid state, whose parts are in constant motion upon one another, always shifting their situation with respect to themselves and the body, and which may lose a portion without affecting itself or the body, can possibly be alive; let us see if it is also difficult to conceive that a body may be so compounded, as to make a perfect whole of itself, having no parts dissimilar, and having the same properties in a small quantity, as in a great. Under those circumstances, the removing a portion is not taking away the constituent part, upon which the whole depends, or by which it is made a whole, but is only taking away a portion of the whole; the remaining portion being equal in quality to the whole, and in this respect is similar to the reducing a whole of any thing. This might be perfectly illustrated without straining the imagination, by considering the operation of union by the first intention. Union, by the first intention, is an immediate sympathetic harmony between divided parts, when brought simply into contact, which I call contiguous sympathy. In this case, it is not necessary that the very same parts should oppose each other, else harmony, and consequently union, could never take place; it is simply necessary that the two parts be alive, and they might be shifted from one sort of living creature to another for ever, without any injury to either, or without exciting irritation; and the whole would still be as perfect as ever. Neither can the motion of one living part upon another affect the body, because all its parts are similar, and in harmony with each other. It is exactly the same with the blood, for neither its motion on itself, nor its motion on the body, can either affect it or the body, since all the parts are similar among themselves. This is the case with all matter, where the property does not depend upon structure or configuration, but upon the compound; for water is still water, whether its parts are moving on each other, or at rest: and a small portion has the same property with the whole, and is in fact a smaller whole. One of the great proofs that the blood possesses life, depends on the circumstances affecting its coagulation; and, at present, we are only to explain the principles upon which these are founded, which it will be in some degree necessary to recapitulate; but, perhaps, the strongest conviction on the mind will arise from the application of this principle to diseases, especially inflammation. While the blood is circulating, it is subject to certain laws to which it is not subject when not circulating. It has the power of preserving its fluidity, which was taken notice of when treating of its coagulation; or, in other words, the living principle in the body has the power of preserving it in this state. This is not produced by motion alone, for in the colder animals, when almost in a state of death during the winter, when their blood is moving with extreme slowness, and would appear to preserve simply animal life through the whole body, and keep up that dependence which exists between the blood and the body already formed, the blood does not coagulate to accomplish these purposes. If the blood had not the living principle, it would be, in respect of the body, as an extraneous substance. Blood is not only alive itself, but is the support of life in every part of the body; for mortification immediately follows, when the circulation is cut off from any part, which is no more than death taking place in the part, from the want of the successive changes of fresh blood. This shows, that no part

of the body is to be considered as a complete living substance, producing and continuing mere life, without the blood; so that blood makes one part of the compound, without which life would neither begin nor be continued. This circumstance, on its first appearance would seem a little extraordinary, when we consider that a part, or the whole, are completely formed in themselves, and have their nerves going to them, which are supposed to give animal life; yet that perfect living part, or whole, shall die in a little time, by simply preventing the blood from moving through the vessels: under this idea, it is not clear to me, whether the blood dies sooner without the body, or the body without the blood. Life then is preserved by the compound of the two, and an animal is not perfect without the blood: but this alone is not enough, for the blood itself must be kept alive; because, while it is supporting life in the solids, it is either losing its own, or is rendered incapable of supporting that of the body. To accomplish all this it must have motion, and that in a circle, as it is a continuance of the same blood which circulates, in which circle it is in one view supersaturated, as it were, with living powers, and in another is deficient, having parted with them while it visited the different parts of the body. Life is, in some degree, in proportion to this motion, either stronger or weaker; so that the blood may be reckoned, in some degree, a first moving power; and not only is the blood alive in itself, but seems to carry life every-where; however, it is not simply the motion, but it is that which arises out of, or in consequence of, the motion. Here then would appear to be three parts, viz. body, blood, and motion; which latter preserves the living union between the other two, or the life in both. These three make up a complete body, out of which arises a principle of self-motion; a motion totally spent upon the machine, or which may be said to move in a circle for the support of the whole: for the body dies without the motion of the blood upon it; and the blood dies without the motion of the body upon it; perhaps pretty nearly in equal times.

" So far, I have considered the blood when compounded with the body and motion, in which we find it preserves its fluidity, and continues life in the body; but fluidity is only necessary for its motion to convey life, and the continuance of life is, probably, owing to its being coagulated, and becoming a solid; or, at least, the support of the body is owing to this cause. For this, however, it requires rest, either by extravasation, or by being retained in the vessels till the utility of circulating is lost; or till it can answer some good purpose by its coagulation, as in mortification. Under any of these circumstances it becomes a solid body; for the moment it is at rest, it begins to form itself into a solid, and changes into this or that particular kind of substance, according to the stimulus of the surrounding parts, which excites this coagulum to action, and makes it form within itself, blood-vessels, nerves, &c.

" The coagulation is the first step towards its utility in the constitution, and this arises from its living principle; for if that principle be destroyed, it does not coagulate at all, that is naturally; for I do not here speak of any chemical coagulation."

The ingenious author next endeavours to prove " that the coagulation of the coagulating lymph bears some analogy to the actions of muscles, which we know to depend upon life;" and which, he says, affords one of the strongest proofs of the existence of this principle. For though the action of coagulation itself be not similar to the actions of muscles; yet, from their being governed by the same laws, he with sufficient reason concludes, that the first principle is the same in both.

As the coagulation of the blood appears to be that process which may be compared with the action of life in the solids, he examines this property a little further, to see if this power of coagulation can be destroyed; and if so, whether, by the same means, life is destroyed in the solids; the phænomena being nearly the same in both.

" Animals killed by lightning, and also by electricity, have not their muscles contracted: this arises from death being instantaneously produced in the muscles, which therefore cannot be affected by any stimulus, nor consequently by the stimulus of death. In such cases the blood does not coagulate. Animals that are run very hard, and killed in such a state, or what produces still a greater effect, are run to death, have neither their muscles contracted, nor their blood coagulated; and in both respects the effect is in proportion to the cause. This is the reason why hunted animals are commonly more tender than those that are shot.

" In many kinds of death, we find that the muscles neither contract, nor does the blood coagulate. In some cases the muscles will contract while the blood continues fluid; in some the contrary happens; and in others the blood will only coagulate to the consistence of cream.

" Blows on the stomach kill immediately, and the muscles do not contract, nor does the blood coagulate. Such deaths as prevent the contraction of the muscles, or the coagulation of the blood, are, I believe, always sudden. Death from sudden gusts of passion is of this kind; and in all these cases the body soon putrifies after death. In many diseases, if accurately attended to, we find this correspondence between muscles and blood; for where there is strong action going on, the muscles contract strongly after death, and the blood coagulates strongly."

The proper deduction from all these facts, Mr. Hunter thinks is perfectly easy.

"This *living principle in the blood*," says he, "which I have endeavoured to show to be similar in its effects to the living principle in the solids, owes its existence to the same matter which belongs to the other, and is the materia vitæ diffusa, of which every part of an animal has its portion: it is, as it were, diffused through the whole solids and fluids, making a necessary constituent part of them, and forming with them a perfect whole; giving to both the power of preservation, the susceptibility of impression; and, from their construction, giving them consequent reciprocal action. This is the matter which principally composes the brain; and where there is a brain, there must necessarily be parts to connect it with the rest of the body, which are the nerves; and as the use of the nerves is to continue, and therefore convey the impression or action of the one to the other, these parts of communication must necessarily be of the same matter; for any other matter could not continue the same action.

"From this it may be understood, that nothing material is conveyed from the brain, by the nerves; nor vice versa, from the body to the brain: for if that was exactly the case, it would not be necessary for the nerves to be of the same materials with the brain; but as we find the nerves of the same materials, it is a presumptive proof, that they only continue the same action which they receive at either end.

"The blood has as much the materia vitæ as the solids, which keeps up that harmony between them; and as every part endued with this principle has a sympathetic affection upon simple contact, so as to affect each other (which I have called contiguous sympathy), so the blood, and the body, are capable of affecting, and being affected, by each other; which accounts for that reciprocal influence which each has on the other. The blood being evidently composed of the same materials with the body, being endued with the same living powers, but, from its unsettled state, having no communication with the brain, is one of the strongest proofs of the materia vitæ making part of the composition of the body, independent of the nerves; and is similar, in this respect, to those inferior orders of animals that have no nerves, where every other principle of the animal is diffused through the whole. This opinion cannot be proved by experiment; but I think daily experience shows us, that the living principle in the body acts exactly upon the same principle with the brain. Every part of the body is susceptible of impression; and the materia vitæ, of every part, is thrown into action; which, if continued to the brain, produces sensation; but it may only be such as to throw the part of impression into such actions as it is capable of, according to the kind of impression; so does the brain or mind. The body loses impression by habit; so does the brain: it continues action from habit; so does the brain. The body, or parts of the body, have a recollection of former impressions, when impressed anew; so has the brain; but they have not spontaneous memory as the brain has, because the brain is a complete whole of itself, and therefore its actions are complete in themselves. The materia vitæ of the body being diffused, makes part of the body in which it exists and acts for this part, probably for this part alone. The whole, taken together, hardly makes a whole, so as to constitute what might be called an organ; the action of which is always for some other purpose than itself: but this is not the case with the brain. The brain is a mass of this matter, not diffused through any thing, for the purpose of that thing, but constituting an organ in itself, the actions of which are for other purposes, viz. receiving, by means of the nerves, the vast variety of actions in the diffused materia vitæ, which arise from impression and habit, combining these and distinguishing from what part they come. The whole of these actions form the mind; and, according to the result, impress more or less of the materia vitæ of the body in return, producing in such parts consequent actions. The brain then depends upon the body for its impression, which is sensation; and the consequent action is that of the mind: and the body depends upon the consequence of this intelligence, or effect of this mind, called the will, to impress it to action; but such are not spent upon itself, but are for other purposes, and are called voluntary.

"But mere composition of matter does not give life; for the dead body has all the composition it ever had: life is a property we do not understand: we can only see the necessary leading steps towards it."

After it is allowed that the blood contains the vital principle, it becomes another question not very easily solved, Whence is this vital principle derived? For this we can only discover two sources; namely, the chyle or aliment from which the blood is prepared, and respiration. The latter has been commonly held as the principal source of the vital principle; and apparently with good reason. See the articles Animal Heat and Pneumatic Medicine.

The *circulation of the blood* is a subject which falls next to be considered, but for this we refer to the article Circulation. Yet here we may venture to give a short abstract of Dr. Wilson's new theory. According to him, the absorbing power of the veins is the principal agent, while the heart and arteries do no more than empty themselves of the blood with which they are filled by the veins. Even this cause, however, he says, would not be sufficient to carry on the circulation for a single moment, without the presence of another which he calls *life*, and does not consider as absolutely unmechanical, though he cannot reduce it either to

mechanical rules or ideas. But as we apprehend all speculations concerning such causes must be arbitrary and without foundation, we forbear to give any detailed account of the Doctor's very singular opinions on this subject.

Amongst other ancient absurdities, we may mention, that blood was formerly held in great esteem as a medicine for some particular diseases. Baths of the blood of infants have been recommended as an infallible remedy for the elephantiasis, &c.; and the blood of goats and some other animals was used by the Galenists, and is recommended even by Dr. Mead in pleurisies: but these abominable remedies, as well as the other, have been long and deservedly exploded. As food, it has been disputed whether blood really affords any nourishment or not. The best judges now, however, are generally agreed, that it is very nutritious; and though out of the body, like the white of an egg, it is very insoluble, yet, like that too, in the body it is commonly of easy digestion. It is, however, highly alkalescent in hot climates; on which account the prohibition of it to the Israelites was very proper. Even in this country, when blood was used as food in great quantity, the scurvy was more frequent than at other times; but to a moderate use of it here no such objection takes place. In some countries we are told, that the barbarians were accustomed to intoxicate themselves by drinking the warm blood of animals; and as it has been shown that this fluid is the immediate reservoir of the vital principle, it seems by no means improbable that it may be possessed of an inebriating quality. Some expressions in scripture seem to countenance this hypothesis.

BLOODING. See Bleeding.

BLOOD-LETTING, the general practice of drawing blood from the body. It is performed with a view either to lessen the quantity of circulating fluid, or to relieve a particular part: hence we have the terms of *general* and *local* blood-letting.

General blood-letting is either performed upon a vein or an artery; and from this circumstance arise the appellations of *phlebotomy*, or *venesection*, and *arteriotemy*.

Local or topical blood-letting is performed by scarificators and cupping-glasses, by leeches, or by punctures made with a lancet, as may be most suitable to the nature of the disease it is intended to remedy. See Blood-letting, topical.

There are some general rules and observations which relate equally to this operation in whatever part of the body it is practised: these we shall in the first place enumerate, and shall afterwards proceed to treat particularly of blood-letting in the arm and other parts.

1. In this, as in every other operation, the situation of the patient, and of the operator likewise, ought to be precisely fixed. The situation of the patient, during the operation of blood-letting, has a considerable influence on the effects produced, and, therefore, merits particular attention. In some disorders, it is the object of this remedy to evacuate a considerable quantity of blood without inducing fainting: when this is the case, and when, from former experience, it is known that the patient is liable, during the evacuation, to fall into a faintish state, a horizontal posture ought to be preferred to every other; for fainting is not near so liable to occur in a horizontal as in an erect posture. It now and then happens, however, that one material advantage expected from the operation of blood-letting, is the production of a state of deliquium; as, for instance, in cases of strangulated hernia, where a general relaxation of the system is of course desirable. In all such circumstances, instead of a horizontal posture, the more erect the patient is kept, the more readily will a state of fainting be induced. The patient ought to be so placed, that the principal light of the apartment may fall directly upon the part to be operated upon, that the vein to be opened may be rendered as apparent as possible.

2. The patient being properly seated, the next step, by means of a proper bandage of silk, linen, or woollen cloth, which has more elasticity, is so to compress the vein intended to be opened, as to prevent the blood from returning to the heart. An equal degree of pressure ought to be applied to all the other veins of the part: for if this be not attended to, the communication preserved by the collateral corresponding branches would render the pressure upon any one particular vein of very little importance. This pressure upon the veins, by inducing an accumulation of their contents, tends to bring them more evidently into view, and consequently renders it easier for the operator to effect a proper opening than he would otherwise find it. The pressure, however, ought never to be carried so far as to obstruct the circulation in the corresponding arteries, otherwise no discharge of blood can take place. When we see that it has the effect of raising the veins, while at the same time the pulsation of the artery is distinctly felt in that part of the member which lies on the side of the ligature most distant from the heart, we may be certain that it is to a very proper degree, and that it ought not to be carried farther; for by the swelling of the veins we are sure that they are sufficiently compressed; and by the arteries continuing to beat, it is evident that a continued flow of blood may be expected.

3. The reflux of blood to the heart being in this manner prevented, the next question to be determined is, the best method of making an opening into the vein. Different instruments have been invented for this purpose; but there are two only which have been retained in use, and which

are all, therefore, that here require to be mentioned. These are the lancet and the fleam. This last, on being placed immediately on the part to be cut, is, by means of a spring, pushed suddenly into the vein, and produces an opening of the exact size of the instrument employed.

When it is determined to employ the lancet, which is by far the safest, the form of that instrument is next the object of attention. The broad-shouldered lancet ought to be laid entirely aside; because the broadness of its shoulders produces always a wound in the external teguments, of, perhaps, three times the size of the opening made in the vein, a circumstance which adds no advantage whatever to the operation; on the contrary, it produces much unnecessary pain, renders it frequently a very difficult matter to command a stoppage of the blood, and the wounds produced by it are commonly so extensive as to be liable to terminate in partial suppuration.

The spear-pointed lancet, on the contrary, is in every respect well calculated for the purpose of venesection. From the acuteness of its point, it enters the teguments and vein with very little pain; which is, with many patients, a circumstance of no small importance. We are sure of making the opening in the vein equal, or nearly so, to the orifice in the external teguments; and the discharge of blood produced by an opening made with one of these lancets, is commonly put a stop to with great ease immediately on removing the ligature upon the vein.

4. The form of the lancet being thus fixed upon, we come now to speak of the method of using it. The surgeon and patient being both properly seated, and the ligature having been applied for a short space of time, in order to produce some degree of swelling in the veins, that vein is to be made choice of, which, at the same time that it appears conspicuously enough, is found to roll less than the others on being pressed by the fingers. It is scarcely thought necessary to observe here, that when a vein appears to be so immediately connected with a contiguous artery or tendon, as evidently to produce some risk of wounding these parts in the operation, another vein not liable to such hazard, if it can be procured, ought undoubtedly to be preferred. Veins may lie directly above both arteries and tendons, and yet no manner of risk be incurred by opening them, provided the operator is sufficiently steady and attentive; but it does now and then happen, that veins are so nearly and intimately connected with these parts; as to render it hazardous even for the most dexterous surgeon to attempt this operation.

The vein being at last made choice of, the surgeon, if he is to use his right hand in the operation, takes a firm hold of the member from whence the blood is to be drawn with his left; and with the thumb of the same hand, he is now to make such a degree of pressure upon the vein, about an inch and a half below the part where the orifice is to be made, as not only to render the skin and teguments somewhat tense, but at the same time to interrupt, for a while, all communication between the under part of the vein and that portion of it lying between the ligature and the thumb placed as thus directed.

The lancet being drawn out so as to form nearly a right angle with the scales, the operator now takes it between the finger and thumb of his right hand; and leaving at least one half of the blade uncovered, he rests his hand on the middle-finger, ring-finger, and little-finger, all placed as conveniently as possible in the neighbourhood of the vein from whence the blood is to be taken; and having pushed the point of the instrument freely through the skin and teguments into the vein, he now carries it forward in an oblique direction, till the orifice is of the size he inclines to have it; taking care, during the time of pushing on the lancet, that its point be kept in as straight a direction as possible, for fear of dipping into the parts below.

The instrument is now to be withdrawn; and the surgeon, removing the thumb of his left hand, is to allow the vein to empty itself freely into the vessel previously provided for that purpose.

It is of importance to observe, that during the time blood is discharging, the member ought to be kept in exactly the same posture it was in when the lancet was first introduced, otherwise the orifice in the skin is apt to slip over the opening in the vein; a circumstance which always proves inconvenient, and on some occasions produces a good deal of trouble, by the blood from the vein insinuating itself into the surrounding cellular substance.

5. When the vein is properly cut, and the orifice is made sufficiently large, it rarely occurs that any difficulty is experienced in procuring all the blood that is wanted. But when this last circumstance occurs, from the patient becoming faint, a stream of fresh air ought to be admitted to the apartment, wine or some other cordial should be administered, and the patient ought to be laid in a horizontal posture. By these means the faintishness will in general be soon removed: but if still the blood should not flow freely, the member ought to be put in all the variety of positions that can probably assist in bringing the openings of the skin and other teguments to correspond with that of the vein; which will soon be known to have happened by the blood beginning instantly to flow. Throwing the muscles of the part into constant action, by giving the patient a cane or other firm substance to turn frequently round in his hand when the operation is done in the arm, will often

answer, in producing a constant flow of blood from a vein, when every other means has failed; and, lastly, when the pulse in the inferior part of the limb is felt very feeble, or especially if it cannot be distinguished at all, we may be thereby rendered certain that the ligature is too tight, and may in general have it in our power to produce an immediate flow of blood, by removing the compression thus improperly made upon the arteries of the part.

6. A quantity of blood proportioned to the nature of the disorder being thus discharged, the pressure upon the superior part of the vein should be immediately removed; and this being done, if the spear-pointed lancet has been used, all farther loss of blood will in general stop immediately. The contrary of this, however, sometimes occurs, and blood continues to flow freely even after the ligature is removed. When this is the case, the operator ought to compress the vein both above and below the orifice, by means of the finger and thumb of one hand, so as to prevent any further loss of blood. This being done, and the orifice being cleared of every particle of blood, the sides of it should be laid as exactly together as possible; and a piece of court or any other adhesive plaster being so applied as to retain them, it will seldom happen that any kind of bandage is necessary; but when the blood has issued with uncommon violence during the operation, and has been difficult to command after the removal of the ligature, in such instances it will be prudent to apply a small compress of linen over the plaster, and to secure the whole with a linen roller properly applied round the limb.

Another mode of blood-letting, is that from the small arteries of a part, termed ARTERIOTOMY. Whatever particular advantages may in theory have been expected from arteriotomy, and however some of its supporters may have recommended it, not only as being in many instances preferable to venesection, but as an operation perfectly safe even in vessels of considerable size, yet the most strenuous friends to the practice have shrunk from any real attempt of this kind on the larger arteries. Instances have no doubt occurred of large arteries having been opened without any danger ensuing; but these are so exceedingly rare, that no practitioner of experience will, from that consideration, be induced coolly to proceed to open any artery of importance. The smaller branches of arteries may indeed be opened with great safety, when they are not deeply covered, and especially when they lie contiguous to bones; but in any of the larger arteries, the attempt must be always attended with so much hazard, and the advantages to be expected from it, in preference to venesection, are apparently so trifling, as must in all probability prevent it from ever being carried into execution.

There are very few arteries, therefore, which, with any propriety, can be opened: the different branches of the temporal are the only arteries indeed from whence blood, in ordinary practice, is ever taken; for although the opening of some other branches of arteries has by some been proposed, yet these are situated in such a manner that they either cannot be readily come at, or being in the neighbourhood of large nerves, the opening of them might be attended with bad consequences. In performing this operation on any of the temporal branches, if the artery lies superficial, it may be done with one push of the lancet, in the same manner as was directed for venesection; but when the artery lies deeply covered with cellular substance, it is always necessary to lay it fairly open to view, before making the orifice with the lancet; for in all the smaller arteries, when they are cut entirely across, there is little chance of being able to procure any considerable quantity of blood from them; as, when divided in this manner, they are sure to retract considerably within the surrounding parts, which commonly puts a stop to all further evacuation.

Some degree of nicety is also necessary in making the opening into the artery of a proper oblique direction, neither quite across nor directly longitudinal; for a longitudinal opening never bleeds so freely, either in an artery or in a vein, as when its direction is somewhat oblique.

If the opening has been properly made, and if the artery is of any tolerable size, it will at once discharge very freely without any compression; but when the evacuation does not go on so well as could be wished, the discharge may be always assisted by compressing the artery immediately above the orifice, between it and the corresponding veins. The quantity of blood being thus discharged, it will commonly happen, that a very slight compression on these smaller arteries will suffice for putting a stop to the evacuation; and whatever pressure is found necessary, may be here applied in the same manner as was directed in venesection.

It happens, however, in some instances, that this does not succeed, the orifice continuing to burst out from time to time, so as to be productive of much distress and inconvenience.

In this situation there are three different methods by which we may with tolerable certainty put a stop to the farther discharge of blood. 1st, If the artery is small, as all the branches of the temporal arteries commonly are, the cutting it entirely across, exactly at the orifice made with the lancet, by allowing it to retract within the surrounding parts, generally puts an immediate stop to the discharge. 2d, When that is not consented to, we have it always in our power to secure the bleeding vessel with a ligature, as we would do an

artery accidentally divided in any part of the body. And, lastly, if neither of these methods is agreed to by the patient, we can, by means of a constant regular pressure, obliterate the cavity of the artery at the place where the operation has been performed, by producing the accretion of its sides. Different bandages have been contrived for compressing the temporal artery; but none of them answer the purpose so easily and so effectually as the one figured in Plate III. fig. 7. This method is more tedious; but to timid patients it generally proves more acceptable than either of the other two.

We shall now speak of VENESECTION *in particular parts of the body.* When venesection is to be performed in the arm, the ligature for stopping the circulation ought to be placed about an inch or an inch and a half above the joint of the elbow, and brought twice round: in order to prevent the ends of it from interfering with the lancet, the knot should be made on the outside of the arm. In general, one knot might answer; but a slip-knot being made above the first, renders it more secure, and it is very easily done.

In making choice of a vein from whence the blood is to be taken, the general rules we have already laid down upon this point must be particularly attended to. In general the artery lies so low in this place, that the median basilic vein, under which it commonly runs, may be opened with perfect safety; and as this vein in general appears more conspicuous than any of the others, probably from the continued pulsation of the artery below obstructing in some measure the passage of its contents, it is in this respect, therefore, more properly calculated for this operation than any of the others. Other circumstances occur too, which render the median basilic preferable to the cephalic or median cephalic veins for the operation of blood-letting. The former, viz. the median basilic, is less deeply covered with cellular substance; and by lying towards the inner part of the arm, it is more thinly covered with the tendinous expansion of the biceps muscle than any of the others. From these circumstances, the operation is always attended with less pain when done in this vein than in any of the others.

In very corpulent people, it sometimes happens that all the larger veins lie so deep as not to be discovered by the eye; but when they are sensibly felt by the fingers, even although they cannot be seen, they may be always opened with freedom. In a few instances, however, they can neither be distinguished by the eye nor by the finger: in such a situation, as they may in general be met with about the wrist or on the back-part of the hand, the ligature should be removed from the upper part of the arm; and being applied about half way between the elbow and wrist, the veins below will thereby be brought into view; and wherever a vein can be evidently observed, there can be no danger in having recourse to the puncture.

We have spoken fully, under the article BLEEDING, of the *mischiefs which occasionally happen from bleeding in the arm*, and have there given the opinions of Mr. Hunter and others as to their supposed causes. Besides the use of the lancet in phlebotomy and arteriotomy, blood is sometimes drawn from the small vessels of a part by scarification. See this subject under the article SCARIFICATION.

BLOOD, DRAGON'S. See SANGUIS DRACONIS.

BLOOD-STONE. See HÆMATITES.

BLOODY-FLUX; *dysenteria sanguinea.* See DYSENTERIA.

BLOW-PIPE, in chemistry and mineralogy, an instrument by which the blast of the breath may be directed upon the flame of a lamp or candle, in such a manner as to vitrify any small portion of mineral substance; and thus the process of assaying in the dry way may be performed in a very short time, where either want of instruments or opportunity prevents other methods from being used. See Plate VI. Mr. Bergman has observed, that this instrument is extremely useful to chemists. It was first introduced into the chemical apparatus about fifty years ago by the celebrated Swedish metallurgist Dr. Andreas Swab, and the instrument was afterwards greatly improved by Messrs. Cronstedt, Rinman, &c. and Dr. Engestroem has an express treatise upon the subject. Mr. Bergman proposes that the tube should be made of pure silver, to prevent it from being injured by rust; with the addition of a small quantity of platina, to give a necessary hardness. It consists of three parts, which may be occasionally joined; an handle fig. 3. terminating in a truncated conical apex *a a*, which may, by twisting, be so adapted to the aperture *b* fig. 4. as to shut it more closely than can be done by a screw. It was an improvement of former chemists, to have a hollow ball on the tube to collect the moisture of the breath, which, if suffered to accumulate, would greatly diminish the intensity of the flame. Instead of this, Mr. Bergman made use of the little box fig. 4. formed of an elliptical plate, so bended through the centre that the opposite sides become parallel, and are joined round by a plate equal in breadth to *c c*. Such a box collects the moisture of the breath as well as the sphere, and is besides attended with the advantage of a compressed figure and smaller circumference. The aperture *b* is somewhat conical, and hollowed out of the solid piece; and has no margin turned inward, lest the efflux of the fluid collected after long blowing, or the cleansing of the internal parts, should in any degree be prevented. The tube fig. 5. is very small, and its shorter conical

end *e e* exactly fitted to the aperture *f*, so that no air can escape except through the orifice *g*. Some of those tubes should be provided with orifices of different diameters, to be applied on different occasions: the orifice *g* itself ought to be smooth and circular, otherwise the cone of flame, hereafter to be mentioned, will be divided. The bands *hh*, *ii*, prevent the conical apices *aa*, *ee*, from being thrust in too far, and also serve another purpose; for when these apices are, by repeated attrition, at last so much diminished as to fall out spontaneously, by filing away a little of the bands they may again be made tight. The figures of the apparatus are about half the proper size.

The greatest difficulty attending the use of the blow-pipe is the supplying it with a constant stream of air by means of the breath; for to such as are unaccustomed to it, it appears a contradiction to think of blowing a stream of air out by the mouth, at the same time that we are drawing it in by the nostrils to supply the necessary functions of respiration. An uninterrupted stream of air, however, is absolutely necessary; and, "to succeed in this operation," says Mr. Bergman, "without inconvenience, some labour and practice are necessary. The whole artifice, however, consists in this, that while the air is inspired through the nostrils, that which is contained in the mouth be forced out through the tube by the compression of the cheeks. To some persons this is extremely difficult; but frequent trials will establish the habit; so that a continual stream of air can be supplied for a quarter of an hour or more, without any other inconvenience than the lassitude of the lips compressing the tube." A very great and obvious improvement, however, is still suggested by Dr. Berkenhout, viz. to apply the tube to the wind-bag of a bagpipe; which being first blown full, may easily be kept so; and being compressed by the arm, will produce a blast either strong or weak as we have a mind. It will be a still farther improvement to supply this bag by means of a small bellows intead of blowing into it with the mouth: for thus the air will be more free from moisture, and also fitter for the support of flame, in other respects; as there is always a considerable quantity of fixed air produced at every respiration, which, according to that quantity, must unfit the air for keeping up the flame, and consequently render the heat less intense.

With regard to the flame proper to be chosen, Mr. Bergman directs a slender candle, either of wax or tallow, fig. 6. with a cotton wick. The burned top must be cut at such a length, that the remainder may be bent a little downwards. The orifice *g* is to be held above and near to this arch, and the air equally pressed forth. The flame being forced to one side by the violence of the blast, exhibits two distinct figures. The internal figure *l*, *n*, is conical, blue, and well defined; and at the apex of this, *n*, the most violent heat is excited. The external flame *l*, *o*, is brownish, vague, and indetermined; and being spoiled of its phlogiston by the surrounding atmosphere, occasions much less heat at its extremity *o*, than the interior flame does.

All eminent chemists, and Dr. Black among the number, greatly recommend the use of the blow-pipe for chemical experiments on minerals. The construction recommended by him differs not from that already described; only he says, that it may be made of tin, a cheaper material than silver; though formerly they were made of glass. The small stream of air issuing from the extremity of the tube, being more intimately mixed with the flame, and agitated with it, occasions a more complete consumption of the vapour arising from the candle, and makes it produce much more heat; so that any small body exposed to the extremity of the flame is heated to a surprising degree. Several artists who work in metals, as the goldsmiths, &c. find this instrument useful in soldering small pieces of metal together; and it is also used by the chemists in examining the effects of violent heat upon small bodies. Some of the artists who use it much, supply the stream of air with a pair of bellows placed under the table, with a pipe rising up through it, and to which the blow-pipe is fixed. In the examination of ores, the more simple instrument is preferred; and by a little practice it is easy to blow a continued stream of air with the mouth, by keeping it always full, and drawing in the air by the nostrils, which answers the same purpose as the upper part of a double bellows. Mr. Cronstedt used the blow-pipe much in making the experiments on which his system of mineralogy is founded, blowing air through a bit of charcoal: and though the specimens are small, we can see the changes they undergo as well as if they were larger; and the eye can be assisted by a magnifying glass.

The reason of the intense heat produced by the blow-pipe is, that in the ordinary way of burning, the air acts only upon the external surface of the fuel, so that it is not so completely inflamed.

The blow-pipe used by Mr. Cronstedt is composed of two parts; and this for the facility both of making, carrying it along, and cleansing it in the inside when necessary. The two parts are represented separate, and of half the size; the figure of the instrument, when these are put together, may be easily conceived. The globe *a* fig. 2. is hollow, and made on purpose to condense the vapours, which always happen to be in the blow-pipe when it has been used some time: if this globe were not there, the vapours would go directly with the wind out into the flame, and thereby cool

the assay. The hole in the small end *b*, through which the wind comes out, ought not to be larger than the size of the finest wire. This hole may now and then happen to be stopped up by something coming into it, so as to hinder the force of the wind: one ought, therefore, to have a piece of the finest wire, to clear it with when required; and, in order to have this wire the better at hand, it may be fastened round the blow-pipe, in such a manner as is represented in fig. 1: *c* is the wire fastened round the blow-pipe, and afterwards drawn through a small hole at *e*, made in the ring *f*, to keep it more steady. That blow-pipe is to be reckoned the best, through which can be formed the longest and most pointed flame from off a common-sized candle. These blow-pipes are commonly made of brass or silver.

There are two different kinds of matter made use of for the support of those substances usually examined by the blow-pipe: the one is charcoal of fir, or beech, cut into the form of a parallelopiped; the other a silver, or which is better, a golden spoon, fitted with a wooden handle. The former is generally used, excepting where phlogiston is to be avoided, or the subject of examination is apt to be absorbed by the charcoal. The golden spoon should not be much larger than that of a deep tea-spoon, as the bulk of the support prevents the heat being raised to a proper degree. To prevent the fine light particles from being carried off by the blast, a small cavity should be hollowed out in the charcoal; in which, being partly protected by another smaller piece of charcoal, they may be exposed to the apex of the flame. By means of a sufficient quantity of the oxygenous gas, experiments with the blow-pipe could be rendered still more important than they are, as we might by this means be able to fuse and vitrify substances *per se*, which we are now scarce able to do with the most powerful fluxes. As this, however, has not yet come into very general use, we can only expect such effects as may be produced by a violent blast of common atmospheric air; and for this purpose we must accommodate ourselves with proper fluxes: but for an account of these and of the subjects proper to be examined by the blow-pipe, recourse must be had to treatises on mineralogy.

BLUBBER, the fat of the whale, and of other large sea-animals, which produces train-oil. It is properly the *adeps* of the animal: it lies immediately under the skin, and over the muscular flesh. In the porpoise it is firm and full of fibres, and invests the body about an inch thick. In the whale, its thickness is ordinarily six inches; but about the under lip, it is found two or three feet thick. The whole quantity yielded by one of these animals ordinarily amounts to 40 or 50, sometimes to 80 or more, hundred weight. The use of blubber is to furnish train-oil, which it does by boiling down. Formerly this was performed ashore, in the country where the whales were caught: but of late the fishers have brought the blubber home in casks.

BLUE, one of the seven colours into which the rays of light divide themselves when refracted through a glass prism. See LIGHT.

BLUE-JOHN, a kind of cubical spar, and like it with respect to its fusibility in the fire. It loses its colour, and becomes white in a moderate heat: the weight of a cubic foot of the bluest kind is 3180 ounces, and that of the least blue is 3140 ounces.

BLUSHING, a suffusion or redness of the cheeks, excited by a sense of shame, on account of a consciousness of some failing or imperfection. Blushing is supposed to be produced from the nervous sympathy which exists between the several parts of the body; the first impression being excited in the mind by some unexpected occurrence.

BOBA'RTIA, in botany, a genus of the digynia order, belonging to the triandria class of plants; and in the natural method ranking under the 4th order, *Gramina*. The calyx is imbricated; and the corolla is a bivalved glume, above the receptacle of the fruit. Of this genus there is only one species known, which is a native of the Indies, and has no remarkable property.

BOCCO'NIA, the GREATER TREE CELANDINE; a genus of the monogynia order, belonging to the dodecandria class of plants, and in the natural method ranking under the 27th order, *Rhœadeæ*. Of this genus there is but one known species, viz. the *frutescens*, which is very common in Jamaica and other warm parts of America, where it grows to the height of ten or twelve feet, having a straight trunk as large as a man's arm, and covered with a white smooth bark. The whole plant abounds with a yellow juice of an acrid nature, which is used by the inhabitants of America to take off specks from the eyes.

BOCHE'TUM, the name of a secondary decoction of lignum vitæ, and of other such woods.

BO'CIA, a glass vessel with a round belly and a long neck, used by the old chemists. It was also called *Ovum sublimatorium*, *Urinale*, and *Cucurbita*.

BODIES, COMBUSTIBLE. This term is given by chemists to all substances, which, on account of their affinity with oxygen, are capable of burning. See COMBUSTION.

BODIES, GASEOUS. See GAS.

BODIES, INFLAMMABLE. Chemists give this name to such bodies as burn with facility, and flame in an increased temperature; although, strictly speaking, all combustible bodies are inflammable bodies: such are, the diamond, sulphur, bitumens, &c.

BODIES, PHOSPHORESCENT; bodies which

produce light, though their temperature be not increased.

BODY ; the collective mass or quantity of matter, of which the world, and every thing in it is composed. In a strictly physical sense, it is every thing that is extended, solid, divisible, and, that in itself has no power of motion ; acting only by external impulse; and also possessing the properties of attraction and repulsion. All that relates to the knowledge of this, under its various modifications and appearances through the whole creation, is the subject of PHYSICS, or natural philosophy ; and, *so far particularly as concerns the economy of the human body, and the regulation of its disorders*, is the province of medicine, and gives its professors, by way of pre-eminence, the title of physicians.

BODY, HUMAN. Anatomists have divided the human body into the head, trunk, and inferior and superior extremities. Each of these have certain regions, by which the physician is enabled to direct the application of blisters and the like ; and the situation of diseases is also better described, in consequence of this *map* as it were, of the body. The head is distinguished into the hairy part and the face. The first has five regions, viz. the crown of the head or *vertex*, the fore-part of the head or *sinciput*, the hind part or *occiput*, and the sides *partes laterales capitis*. The face is distinguished into the region of the forehead, *frons;* temples or *tempora*, the nose or *nasus*, the eyes or *oculi*, the mouth or *os*, the cheeks *buccæ*, the chin or *mentum*, and the ears or *aures*. The trunk is distinguished into three principal parts, the neck, thorax, and abdomen. The neck is divided into the anterior region or *pars antica*, in which, in men, is an eminence called *pomum Adami;* the posterior region is called *nuchæ colli ;* and the lateral regions *partes laterales colli*. The thorax is distinguished into the anterior region, in which are the *sternum* and *mamma*, and at whose inferior part is a pit or hollow called *scrobiculus cordis ;* a posterior region called *dorsum ;* and lateral regions or *latera thoracis*. The abdomen is distinguished into an anterior region, properly the *abdomen*, a posterior region called the loins or *lumbi*, and lateral regions or flanks, called *latera abdominis*. The anterior region of the abdomen being very extensive, is subdivided into the *epigastric*, *hypochondriac*, *umbilical*, and *hypogastric* regions, which are described under their respective names. Immediately below the abdomen is the *mons Veneris*, and at its sides the groins or *inguina*. The space between the organs of generation and the *anus* or fundament is called the *perinæum*. The superior extremity is distinguished into the shoulder, *summitas humeri*, under which is the armpit called *axilla* or *fovea axillaris ;* the *brachium* or arm ; the *antibrachium* or fore-arm, in which, anteriorly, is the bend of the arm, where the veins are generally opened' called *flexura antibrachii ;* and, posteriorly the elbow, called *angulus cubiti*, and the hand, in which are the *carpus* or wrist, the back or *dorsum manus*, and the palm or *vola*. The inferior extremity is divided into, 1. The region of the femur, in which are distinguished the *coxa* or *regio ischiadicha*, and outer and superior part ; 2. The leg in which are the knee or *genu*, the bend or *cavum poplitis*, and the calf or *sura ;* 3. The foot, in which are the outer and inner ankle, or *malleolus externus* and *internus*, the back or *dorsum*, and the sole or *planta*. By some the head is divided differently.

BOERHAAVE (Herman), one of the greatest physicians, as well as best men, that this, or perhaps any age has ever produced, was born in 1668 at Vorhout, a village near Leyden. At the age of sixteen he found himself without parents, protection, advice, or fortune. He had already studied theology and the other ecclesiastical sciences, with the design of devoting himself to a clerical life ; but the science of nature, which equally engaged his attention, soon engrossed his whole time. This illustrious person, whose name afterwards spread throughout the world, and who left at his death above 200,000l. could at that time barely live by his labours, and was compelled to teach the mathematics to obtain necessaries. But in 1693, being received doctor in the science of physic, he began practice ; and his merit being at length discovered, many powerful friends patronized him, and procured him three valuable employments; the first was that of Professor of Medicine in the university of Leyden ; the second, that of Professor of Chemistry ; and thirdly, that of Professor of Botany. The Academy of Sciences at Paris, and the Royal Society at London, invited him to become one of their members. He communicated to each his discoveries in chemistry. The city of Leyden became in his time the school of Europe for this science, as well as medicine and botany. All the princes of Europe sent him students, who found in this skilful professor, not only an indefatigable teacher, but a true friend. The city of Leyden has raised a monument in the church of St. Peter, to the *salutary genius* of Boerhaave. Upon the surface of the pedestal, is the medallion of Boerhaave ; and at the extremity of the frame, a ribband displays the favourite motto of this learned man ; *simplex sigillum veri*, " truth unarrayed."

From the time of the learned Hippocrates, no physician has more justly merited the esteem of his cotemporaries, and the thanks of posterity, than Boerhaave. He united to an uncommon genius, and extraordinary talents, the qualities of the heart, which gave them so great a value to society. He made a decent, simple, and venerable appearance, particularly when age had changed the colour of his hair. He was an eloquent orator, and de-

claimed with dignity and grace. He taught very methodically, and with great precision; he never tired his auditors, but they always regretted that his discourses were finished. He would sometimes give them a lively turn with raillery; but his raillery was refined and ingenious, and it enlivened the subject he treated of, without carrying with it any thing severe or satirical. A declared foe to all excess, he considered decent mirth as the salt of life. It was the daily practice of this eminent person, through his whole life, as soon as he rose in the morning, which was generally very early, to retire for an hour to private prayer, and meditation on some part of the Scriptures. He often told his friends, when they asked him how it was possible for him to go through so much fatigue?—that it was *this* which gave him spirit and vigour in the business of the day. *This* he therefore recommended as *the best rule* he could give: for nothing, he said, could tend more to the health of the body, than the tranquillity of the mind; and that he knew nothing which could support himself or his fellow-creatures, amidst the various distresses of life, but a well-grounded confidence in the Supreme Being upon the principles of Christianity. Of his sagacity, and the wonderful penetration with which he often discovered and described, at the first sight of the patient, such distempers as betray themselves by no symptoms discernible to common eyes, such surprising accounts have been given, as scarcely can be credited, though attested beyond all doubt. Yet this great master of medical knowledge was so far from a presumptuous confidence in his abilities, or from being puffed up by his riches, that he was condescending to all, and remarkably diligent in his profession: and he often used to say, that the life of a patient (if trifled with or neglected) would one day be required at the hand of the physician. He always called the poor his *best patients;* for "God," said he, "is their paymaster." He never regarded calumny nor detraction, nor ever attempted to confute them. "They are sparks," said he, "which, if you do not blow, will go out of themselves. The surest remedy against scandal, is to *live it down* by a perseverance in well-doing." Being once asked by a friend, who had often admired his patience under great provocations, whether he knew what it was to be angry, and by what means he had so entirely suppressed that impetuous and ungovernable passion? he answered, with the utmost frankness and sincerity, that he was naturally quick of resentment; but that he had, by daily prayer and meditation, at length attained to this mastery over himself.

About the middle of the year 1737, he felt the first approaches of that fatal illness which brought him to the grave, viz. a disorder in his breast, which was at times very painful, often threatened him with immediate suffocation, and terminated in an universal dropsy. As death approached, he was so far from shewing terror, that he seemed less sensible of pain, and more cheerful under his torments, which continued till the 23d day of September, 1738, on which he died, being then in the 70th year of his age. He wrote, 1. *Institutiones Medicæ.* 2. *Aphorismi de Cognoscendis & Curandis Morbis.* 3. *Institutiones & Experimenta Chemiæ.* 4. *Libellus de Materia Medica, et Remediorum formulis quæ serviunt Aphorismis.*

BOERHA'AVIA, American HOG-WEED; a genus in Linnæus's botany, of which he enumerates six species.

BOG-BEAN. See TRIFOLIUM PALUDOSUM.

BOHEA TEA. See TEA.

BOILING, or EBULLITION; the bubbling up of any fluid. The term is most commonly applied to that bubbling which happens by the application of fire; though that which ensues on the mixture of an acid and alkali is sometimes also distinguished by the same name. Boiling, in general, is occasioned by the discharge of an elastic fluid through that which is said to boil; and the appearance is the same, whether it is common air, fixed air, or steam, that makes its way through the fluid. The boiling of water is occasioned by the lowermost particles being rarefied into vapour, by reason of the vicinity of the bottom of the containing vessel. In consequence of this, being greatly inferior in specific gravity to the surrounding fluid, they ascend with great velocity, and, agitating the body of water in their ascent, give it the tumultuous motion called *boiling.* Boiling is an important process both in pharmacy and chemistry. In the former, it is used for extracting the properties of solid substances, as roots, herbs, &c.; in the latter, for a variety of purposes of experiment, but particularly for evaporation. See the article EVAPORATION.

BOILING, in the culinary art, is a method of dressing meat by coction in hot water, intended to soften them, and dispose them for easier digestion. The effects of boiling are different according to the kinds and qualities of the water. Pulse boiled in sea-water grow harder; mutton boiled in the same becomes softer and tenderer than in fresh water, but tastes saltish and bitter. Dr. Cullen complains of our modern cooks, for their insufficient application of this process, particularly in the case of some of the *brassicæ* or cabbage tribe (see BRASSICA), which, for the sake of being served up of a fresh green colour, are rendered less digestible than they might be by a farther application of heat.

BOIOBI; a species of serpent found in America, and called by the Portuguese *cobra de verb.* It is about an ell in length, of the thickness of a man's thumb, and is all over of a very beautiful and shining green. It lurks about houses, yet never injures any creature unless provoked or hurt;

but it will then bite, and its poison is very fatal. The natives take, as a remedy against its poison, the root of *caa apia* bruised and mixed with water. See Caa apia.

BOIS DE COISSI. See Quassia.

BOLAR EARTHS. See Boles.

BOLE, ARMENIAN, *bolus armenæ*, (See Boles); a red coloured earth. It is occasionally mixed with honey, and applied to children's mouths as a remedy for aphthæ. It forms, like all argillaceous earths, a good tooth-powder, when mixed with myrrh, or some aromatic substance.

BOLES; a kind of viscid earths, less coherent, and more friable than clay; more readily uniting with water, and more freely subsiding from it. They are soft and unctuous to the touch; adhere to the tongue; and by degrees melt in the mouth, impressing a light sense of astringency. There are a great variety of these earths; the principal of which are, 1. *Armenian bole*, when pure, is of a bright red colour with a tinge of yellow: it is one of the hardest and most compact bodies of this class, and not smooth and glossy like the others, but generally of a rough and dusty surface. It does not effervesce with acids, though some part of it is dissolved by all of them. Like most other coloured earths, this kind of bole contains a portion of ferruginous matter, to which the colour is owing. It is likewise impregnated with vitriolic acid; and hence, when mixed with nitre or sea-salt, it extricates the acids of these salts in the fire. 2. *French bole* is of a pale red colour, variegated with irregular specks of white and yellow. It is much softer than the Armenian, and slightly effervesces with acids. 3. *Bole of Blois* is yellow, remarkably lighter than most of the other yellow earths, and effervesces strongly with acids. 4. *Bohemian bole* is of a yellow colour, with a cast of red, and generally of a flaky texture. It is not acted on by acids. 5. *Lemnian earth* is of a pale red colour, and slightly effervesces with acids. 6. *Silesian bole* is of a pale yellow colour, and acids have no sensible effect upon it. These and other earths, made into little masses, and stamped with certain impressions, were formerly called *terræ sigillatæ*.

BOLETTO, frit; an imperfect or half-made glass.

BOLETUS, spunk; a genus of funguses in Linnæus's botany. It belongs to the *cryptogamia* class of plants; of which botanists enumerate seventeen species. The following are the most remarkable: 1. The *suberosus*, or white cork spunk, growing commonly on the trunks of birch and willow trees in England and Scotland. It grows sessile and horizontal; its figure is semi-circular; the upper side convex, the under nearly plain; of various sizes, from that of an ass's hoof to a peck measure. The upper surface is quite white, generally covered with a short strong down, but sometimes smooth. The flesh, or internal substance, is thick, white, tough, light, and spongy, like cork; and is sometimes cut and shaped by the country people, and used as corks in their bottles: but such corks must not be suffered to touch the liquid, for moisture soon renders them soft and useless. 2. The *igniarius*, or touchwood spunk, is frequent on the trunks of old trees of all kinds, especially ash. It consists of a very hard woody substance, in shape like a horse's hoof, and grows of various sizes, from a man's fist to that of his head, and larger. The upper side is smooth, but uneven, distinguished near the rim by elevated zones of different colours, brown, grey, tawny, &c. The flesh is of a tawny brown colour, extremely hard and tough. This fungus is made use of in Germany and some parts of England for tinder. The Germans boil it in strong ley, dry it, and boil it again in solution of saltpetre. The Laplanders burn it about their habitations, in order to keep off a species of the gadfly, which is fatal to the young rein-deer. After being beaten soft with a hammer, it has been used to stop the bleeding of the vessels after amputation, but it is not to be depended on. 3. The *bovinus*, or cow spunk, is frequent in woods and pastures. It is generally of a brown colour, though sometimes it is tawny, yellow or reddish brown, deep red, purple, or greenish brown. The flesh is yellow, white, or reddish. The young plants are eaten in Italy, and esteemed a great delicacy. The Germans also account them a dainty, calling them *gombas*, and *brat-bulz*. Cows, deer, sheep, and swine, will feed upon this and other boleti, and are sometimes greatly disordered by them. *Scarabs*, *dermestes*, and many other insects, breed in them in abundance. 4. The *laricis*, or agaric of the shops, which grows on old larch trees. See Agaricus. This fungus is an irregular spongy substance, extremely light, and of an uniform snowy whiteness, except the cortical part, which is usually taken off. This species was formerly in great esteem as a cathartic, but it is now rejected by the colleges.

BOLETUS LARICIS; the systematic name for the officinal agaricus albus. See Agaricus albus.

BOLETUS SUAVEOLENS; the systematic name for the fungus salicis of the pharmacopœias. See Fungus Salicis.

BOLISMUS; a word used by Avicenna instead of bulimus.

BOLOGNIAN STONE; a phosphoric substance first discovered near Bologna in Italy, whence it received its name. It has been supposed to contain some metallic matter, on account of its great specific gravity; but it is now found to be only a compound of ponderous earth and vitriolic acid, called *sulphate of barytes*. See Barytes. Some experiments on a stone of this kind from China, have proved that it perfectly agrees with

the descriptions given, in several books, of as tone called *petuntse* by the Chinese, and which is said to be used in their porcelain manufactures.

BOLT-HEAD, is a kind of bellied glass, formerly used by the chemists. It had a long upright cylindrical neck, much slenderer than the body; nearly of the same make with a glass egg.

BOLTING, or BOULTING; the act of separating flour from the bran, by means of a sieve or bolter.

BO'LUS, (βωλος, a mass); an extemporaneous form of medicine, soft, coherent, a little thicker than honey, and the quantity of which is a little morsel or mouthful; for which reason it is by some writers called *buccella*.

BO'LUS ARME'NIÆ. See BOLE, ARMENIAN.

BOLUS GALLICUS; French bole. See BOLES. It is occasionally administered as an absorbent and antacid.

BO'MBAX, called also *gossypium;* the COTTON TREE. The seeds of this tree, which is the *gossypium herbaceum; foliis quinquelobis subtus eglandulosis, caule herbaceo* Linn. are directed for medicinal use in some foreign pharmacopœias; and are administered in coughs, on account of the mucilage they contain. The cotton, the produce of this tree, is well known for domestic purposes, and as an article of commerce.

BOMBIATES; salts formed by the union of the bombic acid with different bases; thus we have bombiate of alumine, &c. in the new chemical nomenclature. Fourcroy enumerates twenty-four combinations of this kind.

BOMBIC ACID; the acid obtained from the silk-worm. Silk-worms contain, especially when in the state of chrysalis, an acid liquor, in a reservoir placed near the anus. Mr. Chaussier has made some important experiments on this acid, and has furnished two methods of extracting it. The first consists in bruising the chrysalides, and straining them through a cloth. The fluid which passes is strongly acid; but the acid is weakened by various foreign substances, of which it may be cleared by digestion in spirit of wine. The fluid which passes the filter after this digestion, is of a fine orange colour. More spirit of wine is to be poured upon it. At every addition of spirit a light whitish precipitate is formed; and the additions of spirit are to be continued till no more precipitate appears. But, instead of bruising the chrysalides, they may be infused in spirit of wine, which dissolves all the acid; and, as this acid is less volatile than the spirit, this last may be evaporated, and the residue filtered. By these precautions, the acid may be cleared of its spirit of wine, and of the mucous matter, which was dissolved, but remains on the filter. These experiments would seem to prove, that this acid exists in all the states of the silk-worm, even in the eggs; but that in the egg and in the worm it does not exist in a disengaged state, but combined with a gummy glutinous substance. The properties and affinities of this acid are not hitherto ascertained with any degree of precision.

BO'MBUS, (βομβος); a resounding noise, or ringing of the ears. Also, a sonorous expulsion of flatus from the intestines.

BONDUCE'LLA, a species of GUILANDINA.

BO'NDUCH INDORUM, also called *bonduch cinerea;* Molucca nuts, and bezoar nuts.

BONES; those hard and solid parts of the body which constitute its frame-work, or skeleton. Like all other parts into which large vessels do not enter, they are generally of a white colour; only in a living animal they are blueish, which is owing to the blood in the small vessels under their surface. The less therefore, and fewer the vessels are, and the thicker and firmer the bony surface covering the vessels is, the bones are whiter. Hence the bones of adults are whiter than those of children; and, in both old and young, the white colour of different bones, or of the several parts of the same bone, is always in proportion to their vessels and solidities; which circumstances ought to be regarded by surgeons, when they are to judge of the condition of bones laid bare.

Bones are composed of a great many plates, each of which is made up of fibres or strings united by smaller fibrils; which being irregularly disposed, and interwoven with the other larger fibres, make a reticular work. This texture is plainly seen in the bones of fœtuses, which have not their parts closely compacted; and in the bones of adults which have been burnt, long exposed to the weather, or whose composition has been made loose by diseases. The chinks which are generally made according to the directions of the larger fibres of bones that have undergone the action of fire, or of the weather, show the greater strength of these than of the fibres which connect them. Numerous accurate observations of the different times in which exfoliations are made from the sides or ends of similar bones, might bid fair to determine what is the proportional force of cohesion in the two sorts of fibres.

The plates are said to be firmly joined to each other by a great number of *claviculi*, or small bony processes, which, rising from the inner plates, pierce through some, and are fixed into the more external ones. Of these nails, four kinds, viz. the *perpendicular*, *oblique*, *headed*, and *crooked*, have been described: but in bones fitly prepared, Dr. Monro says, he could only see numerous irregular processes rising out from the plates.

Though the exterior part of bones is composed of firm compact plates, yet they are all more or less cavernous internally. In some (as in the middle thin part of the *scapula* and *ilium)*, the solid sides are brought so near, that little cavity can be

seen; and in others (e. g. the *os humeri*, *femoris*, &c.), the cavities are so large, that such bones are generally esteemed to be hollow or fistular. But the internal spongy texture is evident in young animals; and some of it may be seen to remain in those of the greatest age, when bones are cautiously opened, after they have been kept so long as to be free of the oil they contain, or after being burnt.

This spongy cavernous internal part of bones is generally called their *cancelli*, or lattice-work, and is formed in the following manner: the plates are firmly joined about the middle of the bone; but, as they are extended towards its ends, the more internal parts separate from the exterior, and stretch out their fibres towards the axis of the bone, where they are interwoven with the fibres of other plates that have been sent off in the same way. Seeing the plates are thus constantly going off, the solid sides of the bones must become thinner, and the lattice-work must be thicker and stronger towards their ends. This is evident in many of them, where the solid sides of their middle are very thick, and the cancelli are scarce observable; whereas, at the ends, where their diameter is greatest, the solid walls or sides are not thicker than paper, and the cancelli are numerous, and large enough to fill up the whole space left between the sides.

The twisting and winding which these cancelli make, and the interstices which they leave, differ considerably in figure, number, and size; and therefore form little cells, which are as different, but communicate with each other. Some writers minutely remark these different appearances of the cancelli, after they begin to separate from the plates; and from thence distinguish them into *wrinkled*, *perforated*, and *net-like*.

The cancelli sustain the membranous bags of the marrow which are stretched upon them, and thereby hinder these membranous parts from being torn, or removed out of their proper places, in the violent motions and different postures which the bones are employed in. This support which the cancelli afford to the marrow, also saves its membranes and vessels, in the lower parts of the bones, from being compressed by the weight of the marrow above.

The depressions between the fibres of the external plates of bones appear like so many furrows on their surface, into each of which the periosteum enters; by which the surface of contact, consequently the cohesion, between it and the bone, is considerably increased, and a greater number of vessels is sent from it into the bone than if it was a plain surface.

Both on the ridges and furrows, numerous little pits or orifices of canals are to be seen, by which the vessels pass to and from the bones.

After a successful injection, the arteries can be traced in their course from the pits to the plates and fibres; and, in sawing, cutting, or rasping the bones of living creatures, these vessels discover themselves by the small drops of blood which then ooze out from the most solid parts of the bones. But the clearest demonstration of the intimate distribution of these small arteries, is, to observe the effect of such a tinging substance as can retain its colour, when swallowed, digested, and mixed with the blood of any living animal, and at the same time has particles small enough to be conveyed into the vessels of the bones: such is the *rubia tinctorum*, madder-root; for we see the gradual advances which this tincture makes from the periosteum into the more internal parts of the bones, and how universally the distribution of the liquors is made, the whole bony substance being tinged by it. Whether the time in which this tinged liquor passes from the outer to the internal plates, till all the plates are made of its colour, and the time which the disappearing of the dye (after giving the creature no more of this sort of food) makes us think it takes to return, are the same in which the natural colours circulate, is uncertain; because this tinging substance may move more slowly, or may pass more quickly, than the natural fluids do. The arteries are larger near each end than at the middle of the large bones that are much moved; because they not only serve the bony plates near the ends, but pass through them to the marrow. As animals advance in age, the arteries of the bones become less capacious; as is evident, first, From the bones of adults having less blood in them than those of children have. Secondly, From many of them becoming incapable, in old age, of admitting the coloured powders used in injections, which easily pass in youth. And, thirdly, From the bones of old creatures being more difficultly tinged with madder than those of young ones. If authors may be credited, the arteries of bones have sometimes become very large.

We may conclude, from arteries being accompanied with veins, so far as we can trace them in every other part of the body, that there are also veins in the bones; and the disappearing of the tincture of madder, after the bones of living animals are coloured with it, could not be without absorbents to carry it away; nay, both these and the veins of bones can be injected.

The bones of a living animal are so insensible, that they can be cut, rasped, or burnt, without putting the animal to pain, yet the nerves distributed in their substance cannot be shewn by dissection; from which it might be inferred, that they have no nerves distributed to them: but the general analogy of nature, which bestows nerves to all other parts, should prevent our drawing such a conclusion. And if sensibility is a sure proof of nerves entering into the composition of any part, as it is generally allowed to be, we have sufficient

evidence of nerves in the bones; for the granulated red flesh which sprouts out from them, after the amputation of a limb, or performing the operation of the trepan, or after an exfoliation, is exquisitely sensible; and in some ulcers of bones, where the periosteum has been separated, the patient suffered great pain if the bone was touched with a rough instrument; nor was he free from pain after the bone was perforated. The reason why the nerves of rigid hard bones become insensible, is, that all nerves must have a considerable degree of flexibility at the part where an object is applied, otherwise they cannot be affected by its impressions. We see this illustrated in a very common analogous case—the growth of a new nail; when the former one has suppurated off, the thin membrane which first appears is exquisitely sensible; but gradually becomes dull in its sensation, till it can be cut or scraped, without causing pain, after it is formed into a hard nail.

From what has been said of the vessels of bones, it is evident, that there is a constant circulation of fluids in every part of them; and that there is a perpetual waste and renewal of the particles which compose the solid fibres of bones, as well as of other parts of the body; the addition from the fluids exceeding the waste during the growth of the bones; the renewal and waste keeping nearly equal in adult middle age; and the waste exceeding the supply from the blood in old age; as is demonstrable from their weight: for each bone increases in weight as a person approaches to maturity; continues of nearly the same weight till old age begins, and then becomes lighter. The specific gravity of the solid sides, on the contrary, increases by age; for then they become more hard, compact, and dense. In consequence of this, the bones of old people are thinner and firmer in their sides, and have larger cavities, than those of young persons.

The vascular texture of bones must make them subject to inflammation, ecchymosis, ulcers, gangrenes, and most other diseases with which the softer parts are affected; and therefore there may be a greater variety of caries than is commonly described.

Hence we can account for the following appearances: 1. *Hæmorrhagies* from fungous flesh rising out from the most solid part of a wounded bone. 2. The regular alternate elevation and subsiding, or apparent pulsation, frequently to be seen in some of the cells of a carious bone. 3. Cells resembling *cancelli*, sometimes seen in that part of a bone, which, in a natural state, is the most solid and firm. 4. A bone, as a tube, including another bone within it, as in *necrosis*.

On the internal surface of the solid parts of the bones there are orifices of canals, which pass through the plates to open into other canals that are in a longitudinal direction; from which, other transverse passages go out to terminate in other longitudinal canals; and this structure is continued through the whole substance of bones; both these kinds of canals becoming gradually smaller as they approach the outer surface. These canals are best seen in a bone burnt till it is white. When it is broken transversely, the orifices of the longitudinal canals are in view; and when we separate the plates, the transverse ones are to be observed. Here, however, we are in danger of believing both these sorts of canals more numerous than they really are; because the holes made by the processes connecting the plates of bones have the appearance of the transverse, and the passages for the blood-vessels resemble the longitudinal canals. It may not be very easy to keep free of error about the transverse canals; but still we may distinguish between the two kinds of longitudinal ones: for the passages of the vessels are largest near the external surface of the bone, and every transverse section of them is circular; whereas the longitudinal canals are largest near the cancelli, and their transverse sections appear to be of a flat oval figure, which may be owing to the different momentum of the fluids conveyed in them. The situation of the larger longitudinal canals, and of the passages of the larger vessels, makes a bone appear more dense and compact in the middle of its solid sides, than towards its outer and inner surfaces, where it is spongy.

We see marrow contained in the larger transverse and longitudinal canals just now described, and from thence judge that it passes also into the smaller ones. See Medulla. The drops of oil which we discover with a microscope every where on the surface of a recent bone fractured transversely, and the oozing of oil through the most solid bones of a skeleton, which renders them greasy and yellow, are a confirmation of the use of these canals. Of what advantage this distribution of the marrow through the substance of bones is, will be mentioned when the nature and use of this animal oil is inquired into.

Most bones have one or more large oblique canals, formed through their sides for the passage of the medullary vessels, which are to be described afterwards.

Bones exposed to a strong fire in chemical vessels, are resolved in the same manner as the other parts of animals, into volatile spirit, salt, fœtid oil, and a residuum. Though this residuum can scarce be changed by the force of fire while it is in close vessels; yet, when burnt in an open fire, the oil, to which it owes its black colour, is forced over, and a white earth is left, which modern chemists have discovered to be calcareous earth united with phosphoric acid. This earth seems to be the proper constituent solid part of bone, and the other principles give it firmness and tenacity: for the

quantity of the earth is so great, that, after all the other principles are separated from a bone, its former shape and size remain. An increase in the proportion of earth in the bones of old people, is supposed to be one reason for their being more brittle than those of young persons.

The use of the bones is to sustain and defend the soft parts of the body. They are lined within, as well as covered externally, with a membrane; which is therefore commonly called *periosteum*. See PERIOSTEUM. Their cells and cylindrical cavities are also filled with an oily fluid, called *marrow*. See MEDULLA.

The broad bones have thin sides, by the plates being soon and equally sent off to form the lattice-work; which therefore is thicker, and nearly of an equal form all through. By this structure they are well adapted to their uses, of affording a large enough surface for the muscles to rise from and move upon, and of defending sufficiently the parts which they inclose.

The round bones have thick strong walls in the middle, and become very thin towards their ends; which is owing to very few plates separating at their middle; where, on that account, the cancelli are so fine and small, that they are not taken notice of: but the cylindrical bones have a large reservoir of marrow in them. Towards their ends the lattice-work becomes very thick, and rather more complete than in the other sort of bones. These round bones having strong forces naturally applied to them, and being otherwise exposed to violent injuries, have need of a cylindrical figure to resist external pressure, and of a considerable quantity of oil to preserve them from becoming too brittle. Besides which, they are advantageously provided with thick sides towards their middle, where the greatest forces are applied to injure them; while their hollowness increases their diameter, and consequently their strength to resist force applied to break them transversely. Thus, for instance, in estimating the proportional resistance of two cylindrical bones of unequal diameters, but consisting of an equal number of similar fibres uniformly disposed round each other, it is plain,

1. That the absolute force of these two bones is equal, because they consist of equal numbers of similar fibres.

2. That the absolute forces of all the fibres in each bone have the same effect in resisting any power applied to break them, as if the sum of all their forces was united in the respective centres of the transverse sections where the fractures are to be made. For, by hypothesis, the fibres being uniformly disposed in each, there is not any fibre in either bone that has not a corresponding fibre; the sum of both whose distances from the axis of revolution (about which all the parts of the bone must revolve in breaking) is equal to two semi-diameters of the bone: consequently each fibre, and all the fibres, may be regarded as resisting at the distance of one semi-diameter or radius from this axis, that is, in the centre.

3. Since the united force of all the fibres is to be regarded as resisting at a distance from the centre of motion equal to the semi-diameter, it follows that the total resistance of all these fibres, or the strength of the bone, is proportional to its semi-diameter, and consequently to its diameter.

Dr. Porterfield has demonstrated, that, of whatever figure bones are, and in whatever manner their fibres are disposed, their strength must always be in a ratio, compounded of the area of their transverse sections, or of their quantity of bony matter, and of the distance of the centre of gravity of these sections, from the centre of motion or fulcrum, on which the bone is supposed to be broken.

Since, therefore, the strength of bones depends on their number of fibres, or quantity of matter, and the largeness of their diameters, we may conclude, that the part of a bone formerly fractured, and re-united by a callus, must be stronger than it was before the fracture happened; because both these advantages are obtained by a callus: which is a wise provision, since bones are never set in such a good direction as they were naturally of; and then wherever a callus is formed, there is such an obstruction of the vessels, that if the bone was again broken in the same place, the ossific matter could not so easily be conveyed to reunite it. This callus may indeed, for want of compression, be allowed to form into a spongy cellular substance; but even in this case the strength of the bone is here increased by one or both of the causes above mentioned.

Many bones have protuberances or processes rising out from them. If a process stands out in a roundish ball, it is called *caput* or *head*. If the head is flatted, it obtains the appellation of *condyle*. A rough unequal protuberance is called a *tuberosity*. When a process rises narrow, and then becomes large, the narrow or small part is named *cervix* or *neck*. Long ridges of bones are called *spines*. Such processes as terminate in a sharp point have the general name of *coronæ* or *coronoid* bestowed on them; though most of them receive particular names from the resemblance they have, or are imagined to have, to other substances, *e. g.* *mastoid*, *styloid*, *anchoroid*, *coracoid*, *spinal*, &c. Such processes as form brims of cavities, are called *supercilia*.

Processes serve for the advantageous origin and insertion of muscles, and they also render the articulations firm and stable. Much the greater number of what are called processes in adult bones, discover themselves in children to be *epiphyses*, or distinct bones, which are afterwards united to the other parts: such are the styloid processes of the temporal bones, processes of the *vertebræ*, *tro-*

chanters of the thigh, &c. However, as we design to insist chiefly on the description of the adult skeleton, in which the union of these parts is so intimate, that scarce any vestige remains of their former separation, we shall retain the common appellation of *apophysis* or *process*, to all such protuberances; but shall remark the principal ones that have no just title to this name, when they occur in the description of particular bones.

On the surfaces of a great many of the bones there are cavities or depressions. If these are deep, with large brims, authors name them *cotylæ*. If they are superficial, they obtain the designation of *glenæ* or *glenoid*. These general classes are again divided into several species: of which, *pits* are small roundish channels sunk perpendicularly into the bone; *furrows*, long narrow canals formed in the surface; *nitches* or *notches*, small breaches in the bone; *sinuosities*, broad, but superficial depressions without brims; *fossæ*, large deep cavities, which are not equally surrounded by high brims; *sinuses*, large cavities within the substance of the bones, with small apertures; *foramina*, or holes, canals that pierce quite through the substance of the bones. When this last sort of cavity is extended any long way within a bone, the middle part retains the name of *canal*, and its ends are called *apertures*.

The cavities allow the heads of bones to play in them; they lodge and defend other parts; they afford safe passage to vessels, muscles, &c. These minutiæ, however, belong rather to the history and demonstration of particular bones, for which see their respective names in the alphabetical arrangement, and also Plates VII. VIII. and IX.

To far the greater number of bones, whose ends are not joined to other bones by an immoveable articulation, there are smaller ones annexed, which afterwards become scarce distinguishable from the substance of the bone itself. These are called *epiphyses* or *appendices*. Some bones have one, others have two, three, or four of those appendices annexed by the means of cartilages, which are of a considerable thickness in children, but by age become thinner, the ossification proceeding from the end of the bone on one side, and from the epiphyses on the other, till at last, in adults, the place of their conjunction can scarcely be seen on the external surface; and it is only sometimes that we can then see any mark of distinction in the cancelli.

The epiphyses are united chiefly to such bones as are destined for frequent and violent motion; and for this purpose they are wisely framed of a larger diameter than the bone they belong to: For, by this means, the surface of contact between the two bones of any articulation being increased, their conjunction becomes firmer, and the muscles inserted into them act with greater force by reason of their axes being further removed from the centre of motion.

Several processes, as the *trochanters* of the thigh, *spine* of the scapula, &c. have *epiphyses;* and processes frequently rise out from epiphyses; for example, at the lower end of the femur, ulna, tibia, &c.

These advantages might indeed have been obtained by the expansion of the end of the bone itself to a thickness equal to that of the epiphysis; but then the constant separation of new plates to form so wide a cellular structure, must have left the solid sides of the bones so thin as to yield easily, either to the action of the muscles fixed to them and passing over them, to the weight several of them are obliged to support, or to the application of any other external force.

Several anatomists have thought that the *epiphyses* serve other purposes; such as securing the ligaments of the articulations which rise out from between the bones and them; for, as soon as these parts are intimately joined, the ligaments insinuated betwixt them must have a much stronger connexion than they could have to the smooth surface of the bones. Such an interception of the ligament between the body of the bone and its epiphysis is not to be seen; but, the adhesion of the periosteum and ligaments to bones being always stronger in proportion to the similarity of their consistence, and the bones remaining longer soft, or of a similar consistence with ligaments, at these places than any where else, the opinion of these writers, concerning the stronger connexion of the ligaments where the bones and epiphyses join, is not without some foundation.

Possibly too, by the fibres of epiphyses not extending themselves so longitudinally as those of the bones, there may be less chance of the former running into each other than of the latter.

The softness of the ends of the bones may be of some advantage in the womb and in parturition; after which the ossification begins at different points to form epiphyses, before the ossification can extend from the middle to the ends of the bones.

With regard to the formation of bone, or the process termed Ossification, it is considered fully under that article; as are the various kinds of connexion of bones with each other, under Joint, Symphysis, Synarthrosis, and Diarthrosis. For the appendages of bones, see Cartilages, Ligaments, &c. The names and number of the bones that compose the human Skeleton, are exhibited in the following Table by Dr. Hooper. To the anatomical student, this is well calculated to impress the memory; whilst the relative situation, connection, &c. of the bones, are shewn in the engraved figures already referred to, which are taken from the works of the celebrated Albinus.

TABLE OF THE BONES.

1. Bones of the Head.

		No.
Bones of the *cranium*,	Frontal	1
	Parietal	2
	Occipital	1
	Temporal	2
	Ethmoid	1
	Sphænoid	1
Bones of the *face*,	Superior maxillary	2
	Jugal	2
	Nasal	2
	Lachrymal	2
	Palatine	2
	Inferior spongy	2
	Vomer	1
	Inferior maxillary	1
The *teeth*,	Incisores	8
	Cuspidati	4
	Molares	20
Bone of the *tongue*,	Hyoides os	1
Bones of the *ear*, within the temporal bones,	Malleus	2
	Incus	2
	Stapes	2
	Orbiculare os	2

2. Bones of the Trunk.

The *spine*.	Vertebræ,	Cervical	7
		Dorsal	12
		Lumbar	5
	Sacrum,		1
	Coccygis os,		1
The *thorax*,		Sternum	1
		Ribs	24
The *pelvis*,		Innominata ossa	2

3. Bones of the Upper Extremity.

The *shoulder*,		Clavicle	2
		Scapula	2
The *arm*,		Humeri os	2
The *fore-arm*,		Ulna	2
		Radius	2
The *hand*.	*Carpus*,	Naviculare os	2
		Lunare os	2
		Cuneiforme os	2
		Orbiculare os	2
		Trapezium os	2
		Trapezoides os	2
		Magnum os	2
		Unciforme os	2
	Metacarpus,		10
	Phalanges,		28

4. Bones of the Lower Extremity.

The *thigh*,		Femur	2
The *leg*,		Patella	2
		Tibia	2
		Fibula	2
The *foot*.	*Tarsus*,	Calcaneus	2
		Astragalus	2
		Cuboides os	2
		Naviculare os	2
		Cuneiform. ossa	6
	Metatarsus,		10
	Phalanges,		28
Sesamoid bones of the thumb and great toe, occasionally found			8
Total of bones in the human skeleton			248

The diseases of bones are Caries, Exostosis, Necrosis, Rickets, Mollities, &c. see those articles.

BONEBINDER. See Osteocolla.

BONONIE'NSIS LA'PIS; the Bononian or Bolognian stone, or phosphorus. See Bolognian stone.

BO'NTIA, Barbadoes' wild olive; a genus in Linnæus's botany. He enumerates two species.

BO'NUS HE'NRICUS, (called *Henricus*, because its virtues were discovered by some one whose name was Henry); otherwise named *tota bona*, and *chenopodium;* english mercury. The plant to which this name is given in the pharmacopœias, is the *chenopodium bonus Henricus ; foliis triangulari-sagittatis integerrimis, spicis compositis aphyllis axillaribus* Linn. It is a native of this country, and common in waste grounds from June to August. The young plant differs little from spinach when cultivated; and in many places the young shoots are eaten in spring like asparagus.

BORACIC ACID, borax, or *borate of soda;* a neutral salt, formed by the combination of soda with a peculiar acid, which was formerly known by the name of Homberg's sedative salt. It is generally afforded by decomposition; it has, however, been lately found perfectly formed in nature. M. Hoefer, director of the pharmacies of Tuscany, was the first who detected this acid salt in the waters of the lake Cherchiajo, near Monte-Rotondo, in the inferior province of Sienna: these waters are very hot, and they afforded him three ounces of the pure acid in one hundred and twenty pounds of the water. The same chemist having evaporated twelve thousand two hundred and eighty grains of the water of the lake Castelnuovo, obtained one hundred and twenty grains of acid from the whole. He also suspects that it may be found in other waters. It is likewise produced in the mines of Tus-

cany; and it has been found by Mr. Westrumb in the stone called the cubic quartz, at Luneburg; from which he obtained it by decomposing the stone by means of the acids of sulphur, nitre, &c. The result of his analysis is as follows: sedative salt, $\frac{6}{10}$; calcareous earth, $\frac{1}{10}$; magnesia, $\frac{1}{10}$; clay and silex, $\frac{2}{100}$; iron, $\frac{1}{200}$ to $\frac{2}{200}$.

It has been observed, that this stone has the form of small cubical crystals, which are in some cases transparent, and in others milky; and that it affords sparks with the steel. The acid of borax is generally found combined with soda; and from this combination it is disengaged, and obtained either by sublimation or crystallization. When it is proposed to obtain it by sublimation, three pounds of calcined sulphate of iron, and two ounces of borate of soda, are dissolved in three pounds of water. The solution is then filtered, and evaporated to a pellicle; after which the sublimation is performed in a cucurbit of glass with its head. The acid of borax attaches itself to the internal surface of the head, from which it may be swept by a feather, or some such implement.

This acid was obtained by Homberg, by decomposing of borax with the sulphuric acid. This process also succeeded very well in Mr. Chaptal's trials. For this purpose he made use of a glass cucurbit with its head, which he placed on a sand-bath. He then poured upon the borax half its weight of sulphuric acid, and proceeded to sublimation. The acid prepared in this way is of the most beautiful whiteness. Both Stahl and the younger Lemery have obtained the same acid by making use of the nitric and muriatic acids.

In order to extract the acid of borax by crystallization, the borax must be dissolved in hot water, and an excess of sulphuric acid poured in. A salt is deposited, during the cooling, on the side of the vessel, in the form of thin round plates, laid one upon the other. This salt, when dry, is very white, and light, of a silvery appearance, and is the acid of borax. We are indebted to Geoffroy for this process; but Baron has added two facts: the first of which is, that the vegetable acids are equally capable of decomposing borax; and the second, that borax may be regenerated by combining the acid of borax with soda. This acid may be purified by solution, filtration, and evaporation; but it must be observed, that a considerable part is volatilized with the water which flies off during the evaporation.

This acid has a saline cool taste, and colours the tincture of turnsole, syrup of violets, &c. red. One pound of boiling water, according to the experiments of Mr. de Morveau, did not dissolve more than one hundred and eighty-three grains of it. But alkohol dissolves it more easily; and the flame which this solution affords is of a beautiful green. When exposed to the fire, it is reduced to a vitriform and transparent substance, instead of rising; which proves, as Rouelle has remarked, that it is only sublimed by favour of the water, with which it forms a very volatile compound. As most of the known acids decompose this acid, and exhibit it in the same form, it has been thought a justifiable conclusion, that it exists ready formed in the borax. Mr. Baumé has even affirmed, that he composed this acid by leaving a mixture of grey clay, grease, and cows' dung, exposed to the air in a cellar. But Mr. Wiegleb, after an unsuccessful labour of three years and a half, has thought himself authorised to give a formal negative to this French chemist.

It has been attempted to be proved by Mr. Cadet, that the acid of borax always retains a portion of the acid employed in the operation, and that this same acid has still the mineral alkali for its basis. But Mr. de Morveau has, with great acuteness and sagacity, discussed all the proofs that have been brought in support of these positions by Mr. Cadet, and has shewn that none of them are conclusive.

This salt, under the name of *sedative*, was formerly in great repute as a medicine in fevers. It is reckoned a mild anodyne, as its name implies; and its effect is described to be that of cooling the blood, preventing febrile delirium, and removing spasmodic affections in hypochondriacal and hysterical cases. The usual dose is from two to twenty grains in solution.

BORAGE. See Borago.

BORA'GO, (formerly written *corago;* from *cor*, the heart, and *ago*, to affect; because it was supposed to comfort the heart and raise the spirits); borage. The leaves and flowers of this plant, *borago officinalis; foliis omnibus alternis, calycibus patentibus* Linn. are still esteemed in some countries as refrigerant and cordial. Their principal use, in this island, is in that grateful summer beverage known by the name of a cool-tankard, to which it imparts an agreeable and exhilarating flavour.

BORA'GO OFFICINA'LIS; the systematic name for the borage of the pharmacopœias. See Borago.

BO'RAS SO'DÆ; borate of soda, or borax. See Borax.

BORA'SSUS; a genus in Linnæus's botany. There is but one species.

BORA'SSUS; the tender medullary substance which grows at the top of the great palm-tree.

BORATES; salts formed of an union of the boracic acid with different bases; thus we have the *borates of soda* (see Borax), of *potass*, of *ammonia*, &c.

The name of *borate of potass* has been given to the combination of the acid of borax with potass. This salt may be obtained either by the direct combination of these two separate principles, or by

decomposing borax by the addition of potass. The borate of potass, which is yet but little known, afforded Mr. Baumé small crystals. The acids decompose this salt by seizing its alkaline base.

The *borate of ammonia*, or the saturated combination of the acid of borax with ammonia, has not yet been sufficiently examined by chemists. Mr. Fourcroy has, however, made the following remarks on this salt: he dissolved a quantity of very pure acid of borax in ammonia, or caustic volatile alkali, till the substances appeared to be mutually and completely saturated: this solution he diluted in a little water, and then evaporated, in a sand-bath, about one half of this liquor. When cooled, it afforded a layer of crystals joined together, and exhibiting on their surface polyhedral pyramids. This salt has a poignant urinous taste; it turns syrup of violets green, gradually loses its crystalline form, and becomes brown by the contact of the air. It dissolves readily enough in water, and lime disengages the ammoniac or volatile alkali from it. This salt seems also to possess a considerable degree of solubility in water.

BO'RAX, (*borak*, Arab.); called by the different names of *boras sodæ*, *boras sodæ alcalescens*, and *tincal;* the BORATE OF SODA. The common borax is a neutral salt, formed by the combination of the acid of borax with soda. This salt is brought from the East Indies; and in the language of the country is called *swagah.* It is brought to Hindostan from the mountains of Tibbet, and is said to be dug up in a crystallized state from the bottom of certain salt lakes in a mountainous, barren, volcanic district, about twenty-five days journey to the eastward of Lassa, the principal town of the kingdom of Tibbet.

It does not appear that borax was known to the ancients. The chrysocolla, of which Dioscorides speaks, was nothing but an artificial solder, composed by the goldsmiths themselves, with urine and rust of copper, which were beaten together in a mortar of the same metal. Borax is first mentioned in the writings of Geber; every thing, therefore, which has been written since that time concerning borax, is applicable to the substance which is at present known to us by that name. Borate of soda, or common borax, is found in commerce in three different states. The first is *brute borax*, *tincal*, or *chrysocolla.* It comes to us from Persia, and is enveloped and soiled by a greasy covering. The pieces of brute borax have almost all of them the form of a six-sided prism, slightly flattened, and terminated by a dihedral pyramid. The fracture of these crystals is brilliant, with a greenish cast. This kind of borax is far from being pure. The second kind of borax known in commerce comes from China. It is purer than the preceding, and has the form of small plates crystallized upon one of their surfaces, on which the rudiments of prisms may be perceived. This borax is mixed with a white powder, which appears to be of an argillaceous nature. The third kind of borate of soda, or common borax, that is met with in commerce, is that which has been refined or purified.

In order to purify borax, nothing more is necessary than to clear it of the unctuous substance which soils it, and impedes its solution. Crude borax, added to a solution of mineral alkali, is more completely dissolved, and may be obtained of considerable beauty by a first crystallization; but it retains the alkali made use of: and borax, purified in this manner, possesses a greater proportion of alkali than in its crude state. The oily part of borax may be destroyed by calcination. By this treatment it becomes more soluble, and may in fact be purified in this way; but the method is attended with a considerable loss, and is not so advantageous as might be expected. The most simple method of purifying borax, consists in boiling it strongly, and for a long time. This solution being filtrated, affords by evaporation crystals rather foul, but which may be purified by a second operation similar to the foregoing.

The borate of soda, when well purified, is white, transparent, and has a somewhat greasy appearance in its fracture. It crystallizes in hexahedral prisms, terminated by trihedral, and sometimes hexahedral pyramids; has a styptic taste; and converts syrup of violets to a green colour.

If borax be exposed to the fire, it swells up; the water of crystallization is dissipated in the form of vapour, and the salt then becomes converted into a porous, light, white, and opaque mass, commonly called calcined borax. If the fire be more strongly urged, it assumes a pasty appearance, and is at length fused into a transparent glass of a greenish yellow colour, soluble in water; and which loses its transparency by exposure to the air, in consequence of a white efflorescence that forms upon its surface. This salt requires eighteen times its weight of water, at the temperature of sixty degrees of Fahrenheit's thermometer, to dissolve it; but boiling water dissolves one sixth of its weight. Barytes and magnesia decompose borax. Lime-water precipitates the solution of this salt; and, if quick-lime be boiled with borax, a salt of sparing solubility is formed, which is the borate of lime. Borax is used as an excellent flux in docimastic operations. It enters into the composition of reducing fluxes, and is of the greatest use in analyses by the blow-pipe. It may be applied with advantage in glass manufactories; for, when the fusion turns out bad, a small quantity of borax re-establishes it. It is more especially used in soldering. It assists the fusion of the solder, causes it to flow, and keeps the surface of the metals in a soft or

clean state, which facilitates the operation. It is scarcely of any use in medicine.

This salt has the inconvenience of swelling up, and requires the greatest attention on the part of the artist who uses it in delicate works, more especially when designs are formed with gold of different colours. It has been long a desideratum to substitute some composition in the room of borax, which might possess its advantages without its defects. With this view, the following process has been published by Mr. Georgi: "Natron, mixed with marine salt and Glauber's salt, is to be dissolved in lime-water; and the crystals which separate by the cooling of the fluid may be set apart. The lixivium of natron is then to be evaporated; and this salt afterwards dissolved in milk. The evaporation affords scarcely one-eighth of the natron employed, and the residue may be applied to the same uses as borax." It has been also affirmed, that the phosphate of potass, fused with a certain quantity of sulphate of lime, constitutes an excellent glass for soldering metals with.

Borax is generally employed in solution, to detach mucus, &c. from the mouth in putrid fevers. It also possesses an acid and deobstruent virtue, and is given internally in cardialgia. The other salts formed by the union of the acid of borax with different bases, are called borates. See Borates.

BORBO'NIA; a genus in Linnæus's botany. He enumerates six species.

BORBO'NIA, the Carolinian bay-tree with red stalks and blue berries; a species of Laurus.

BORBORY'GMUS, (βορβορυγμος; from βορβορυζω, *to make a noise*); the rumbling noise occasioned by flatus in the intestines. It frequently precedes hysterical affections.

BORI'DIA, a sort of salt meat, prepared of a kind of fish, which is eaten raw. Oribasius takes notice of it.

BOROZAIL, the Ethiopian name for the venereal disease. It is a name for the *Zail* of the Ethiopians, which is a disease epidemic about the river Senegal. It principally infests the pudenda, but is different from the lues venerea, though it owes its rise to immoderate venery. In the men it is also called *Asab;* in the women, *Ossa batus.*

BO'SA, an Egyptian word for a mass which is made of the meal of darnel, hemp-seed, and water. It is inebriating in its effects.

BO'SEA; a genus in Linnæus's botany. There is but one species, viz. *Bosea Yervamora*, golden-rod tree.

BOTANY, (from βοτανη, *herba*, a plant or herb), in the utmost extent of the word, signifies a knowledge of plants, and of the uses to which they may be applied, either in medicine, chemistry, or in the different arts. As the medical virtues of plants fall properly under the province of the physician, so their chemical properties belong to the chemist, &c. Hence the science of botany is commonly restricted to a bare knowledge of the different plants themselves, and of the distinguishing marks whereby each individual species may be known from every other. This knowledge is indispensably necessary for those who propose to apply plants to any useful purpose: for example, though we should suppose a physician ever so well acquainted with the virtues of opium, and a chemist ever so well acquainted with the method of preparing it, yet if both of them were entirely ignorant of botany, so as to be unable to distinguish the particular species of poppy which produces opium from others of the same genus, it is evident their medicinal and chemical skill could be of no use.

The utility of botanical classifications may be further illustrated from the following considerations:

1. With regard to *Food.* Many animals are endowed with an instinctive faculty of distinguishing with certainty whether the food presented to them be salutary or noxious. Mankind have no such instinct: they must have recourse to experience and observation. But these are not sufficient to guide us in every case. The traveller is often allured by the agreeableness of smell and taste to eat poisonous fruits. Neither will a general caution not to eat any thing but what we know from experience to be salutary, answer in every emergency. A ship's company, in want of provisions, may be thrown upon an uninhabited coast or a desert island. Totally ignorant of the nature of the plants they meet with, diseases, or scarcity of animals, may make it absolutely necessary to use vegetable food. The consequence is dreadful: they must first eat before any certain conclusion can be formed. This is not the description of danger arising from an imaginary situation. Before the vegetables that grow in America, the East and West Indies, &c. became familiar to our sailors, many lives were lost by trials of this kind: neither has all the information received from experience been sufficient to prevent individuals from still falling a prey to ignorance or rashness.—If the whole science of botany were as complete as some of its branches, very little skill in it would be sufficient to guard us infallibly from committing such fatal mistakes. There are certain orders and classes which are called *natural*, because every genus and species comprehended under them are not only distinguished by the same characteristic marks, but likewise possess the same qualities, though not in an equal degree. For example: shew a botanist the flower of a plant whose calix is a double valved glume, with three stamina, two pistils, and one naked seed; he can pronounce with absolute cer-

tainty, that the plant from which the flower was taken, bears seeds of a farinaceous quality, and that they may be safely used as food. In like manner, shew him a flower with 12 or more stamina, all inserted into the internal side of the calix, though it belong to a plant growing in Japan, he can pronounce without hesitation, that the fruit of it may be eaten with safety. On the other hand, shew him a plant whose flower has five stamina, one pistil, one petal, or flower-leaf, and whose fruit is of the berry kind, he will tell you to abstain from it, because it is poisonous. Facts of this kind render botany not only a respectable, but a most interesting science.

2. With respect to *Medicine*, the same thing holds good. It is found by experience, that plants which are distinguished by the same characters in the flower and fruit, have the same qualities, though not always in an equal degree as to strength or weakness; so that, upon inspection of the flower and fruit, a botanist can determine *a priori* the effects that will result when taken into the stomach. In order, therefore, to determine the medical virtues of all the plants belonging to a natural class, the physician has nothing to do but to ascertain by a set of clear and unquestionable experiments, the virtues of any one of them. This greatly shortens the labour of investigation. Supposing the number of known species to be 20,000; by ascertaining the virtues of one genus, at a medium, we determine the virtues of 12 species. But by ascertaining the virtues of one genus belonging to a natural order, the virtues of perhaps 300 or 400 species are ascertained.

The origin of this science, like that of most others, cannot be found out from the most ancient histories; but it is very probable, that some degree of botanical knowledge has existed in every age of the world. The first botanical writings of which we have any account are those of Solomon, who we are informed by scripture did write a treatise upon this subject; but that is absolutely lost, not being quoted by any ancient author, nor the least fragment of the treatise itself remaining. Among the Greeks, Anaxagoras, Pythagoras, and other ancient philosophers, wrote treatises on plants; but their works are also lost; and from the quotations that yet remain in the works of Theophrastus, Dioscorides, and Pliny, we learn, that those first botanical writings could convey but very little knowledge.

The historical æra of botany, therefore, commences with Theophrastus the disciple of Aristotle. He was born at Eresium, in the island of Lesbos; and flourished in the third century before the Christian æra, being about 100 years posterior to Hippocrates. His work is entitled *The History of Plants*, and treats of their origin, propagation, anatomy, and construction; of vegetable life, and of vegetation. It consisted originally of ten books; but of these only nine are now extant. In these, vegetables are distributed into seven classes or primary divisions; which have for their object, the generation of plants; their place of growth; their size as trees and shrubs; their use as pot herbs and esculent grains; and their lactescence, or the liquor of whatever colour, that flows from plants when cut. In his work, about 500 different plants are described.

The next botanist of any note was Dioscorides, a Grecian by birth, but under the Roman empire, being near 400 years posterior to Theophrastus. He describes about 600 plants; and these he has arranged, from their uses in medicine and domestic economy, into four classes, which are thus designed: aromatics; alimentary vegetables, or such as serve for food; medicinal; and vinous plants.

Almost cotemporary with Dioscorides flourished Antonius Musa, Cato, Varro, Virgil, and Columella; the first, author of a treatise still extant on the plant *betony*; the four others celebrated for their useful tracts on agriculture and rural economy.

Pliny the Elder, in his voluminous work, entitled *The History of the World*, has a botanical part which is contained in fifteen books. In these, besides the plants of Theophrastus and Dioscorides, he has given descriptions of several new species, extracted probably from works which would otherwise have been totally lost. Pliny uses scarce any mode of arrangement, except the ancient, but very incorrect, distinction into trees, shrubs, and herbs. His plan, however, extends not only to botanical distinctions, but to gardening, agriculture, and whatever is connected either more nearly or remotely with the science of plants. He gives descriptions of above 1000 different species; but from the want of a proper systematic arrangement, it is often difficult, and perhaps impossible, to determine what plants he or other ancient botanists do really describe.

This want of precision in properly arranging their plants was the reason why the botany of the ancients was always very limited, and after the time of Pliny declined so rapidly. On the destruction of the western empire by the Goths and other barbarous nations, it is not to be thought that botany could survive any more than the other sciences. It was not till near the close of the eighth century, that the ancient botany began again to appear in Arabia. Serapion, well known in medicine, stands first in the Arabian catalogue of botanists; to him succeeded Rhases, Avicenna, Averrhoes, Actuarius, &c. An author known by the name of *Plato Apuleius*, or *Apoliensis*, of whose *herbarium* very old manuscript copies are preserved in some curious libraries, is supposed to have lived near this period. The works of most of these botanists,

however, were only translations and compilations from the Greek writers; so that, for want of a proper systematic arrangement, the science sunk a second time into total oblivion. For near 400 years after Abenguefit, an Arabian physician who flourished in the end of the twelfth century, scarce any attempts were made in the botanical way. Some obscure writers, indeed, appeared in several parts of Europe; as, Arnoldus del Villa Nuova; Platearius; Matthæus Sylvaticus; and Bartholomew Glanvil, commonly called *Bartholomeus Anglus*, a Franciscan monk, descended of the family of the earls of Suffolk, who lived in the reign of King Edward III. and wrote a book of natural history, intitled *De proprietatibus rerum*, which was translated into English by John de Trevisa in 1398: but though all these wrote on plants, they were so totally destitute of method, that their works remain one great chaos, from whence it is impossible to extract any thing.

On the revival of letters in the beginning of the sixteenth century, the botany of the ancients was restored a second time. The Greek writings were translated into Latin, the common language of Europe. Gaza, a Greek refugee at Rome, made elegant translations of Aristotle and Theophrastus, who afterwards were commented upon by Scaliger and Stapel. Dioscorides was also translated and commented on. His best commentators are Hermolaus Barbarus, Fuchscius, Ruellus Cordus, Gesner, and Matthiolus. The most distinguished commentators on Pliny are Dalechamp in 1604, Salmasius in 1689, Harduin, and Guilandinus. Meursius and Ursinus have written commentaries upon Cato; Campegius and Monardes upon Mesuc the Arabian, and Lonicer upon Avicenna. This last has been translated by several writers, particularly Alpagus, Costæus, and Plempius, into Latin; and by one writer, Amalthæus, into Hebrew.

Hieronymus Bock, or Bouc, a German, generally known by the name of *Tragus*, is the first modern who has given a methodical distribution of vegetables. In 1532, he published a History of Plants, in which he describes 800 species; and these he divides into three classes, founded on the qualities of vegetables, their figure, habit, and size. The same method of arrangement was followed by Lonicer, Dodonæus, L'Obel, Clusius, Brunsfelsius, Monordes, Cordus, and some other botanists of this period. How far such a method was deficient, modern botanists will very readily suppose; however, it was not till 1560 that Conrad Gesner first proposed to the world an arrangement of vegetables from the parts of the flower and fruit. He did not establish any plan founded upon this principle; but, having suggested the idea, left the application to be made by others; and in 1582, Dr. Andrew Cæsalpinus, physician at Pisa, and afterwards professor of botany at Padua, first availing himself of the ingenuity of his predecessor, proposed a method of arrangement which has the fruit for its basis; and thus gave origin to systematic botany, the second grand æra in the history of that science.

Even this improved method of Cæsalpinus was not without very great inconveniences; as it was, however, so greatly superior to every thing that had appeared before, it might have been expected that the learned would have immediately adopted it, and that all the former equivocal and insufficient characters would have been rejected. But the fact was otherwise. Cæsalpinus's method of arrangement died with him; and it was not till near a century after, that Dr. Robert Morison, of Aberdeen, attaching himself to the principles of Gesner and Cæsalpinus, re-established scientific arrangement upon a solid foundation; so that, from being only the restorer of system, he has been generally celebrated its founder. In the long interval between Cæsalpinus and Morison, flourished some eminent botanists. The most noted are, Dalechamp, author of a General History of Plants; Theodore, surnamed *Tabemæmontanus*, and Thalius, two German writers; Porta, an Italian, famous for an arrangement of plants from their relations to the stars, to men, and other animals; Prosper Alpinus, author of a Catalogue of the Plants of Egypt; Fabius Columna, inventor of many of the botanical terms now used; the two Bauhins; Gerard and Parkinson; Zaluzianski, a Pole, author of an arrangement from the qualities and habit of plants; Marcgrave and Piso, celebrated for their Natural History of Brasil; Hernandez, equally celebrated for his history of Mexico; Passæus, or Du Pas, author of an arrangement of plants from the time of flowering, of all characters the most uncertain and insufficient; Johnston; Bontius, a Dutchman, author of a Natural History of the East Indies; Aldrovandus, the celebrated naturalist; and Rheede, governor of Malabar, author of the well-known *Hortus Malabaricus*.

The method proposed by Morison has the fruit for its basis, as well as that of Cæsalpinus; to which, however, it is greatly inferior both in the plan and execution. It is, indeed, of all others, the most difficult in practice; and was, therefore, not adopted by any succeeding writer, except Bobart, who in 1699 completed Morison's Universal History of Plants, and an anonymous author whose work appeared in 1720. Imperfect, however, as his method is, it furnished many useful hints, which succeeding botanists have not failed to improve. Ray and Tournefort have owed him much, and are not ashamed to own the obligation. The same has been done even by Linnæus; who has established the science of botany on the most solid foundation, by introducing a method of arrangement, if not

absolutely perfect, at least as nearly approaching to perfection as can be expected. This, therefore, has been deservedly followed, in preference to every other, by all botanists, since its first publication. But to give a particular account of all the different botanical systems, with the particular advantages and disadvantages attending each, would carry us greatly beyond our prescribed limits; we shall, therefore, proceed at once to a description of the Linnæan, as the only system worthy of the student's attention.

The Linnæan system of classing plants is founded upon the supposition, that vegetables propagate their species in the same manner as animals; hence it is very appropriately named the *Sexual* System.

The *stamina* he considers as the male, or fœcundating part, and the *pistil* as the female. In some species the male and female flowers are different, and in some, as the palm-tree, they grow upon different plants. But in the majority, the male and the female are found within the same *corolla*, and this large division of vegetables he styles *hermaphrodite* plants. It is of little consequence to the botanist, who wishes only to become acquainted with the genus and character of a plant, whether this system be philosophically true or not: it is sufficient that it has been found the most commodious method of classification hitherto invented. On these principles Linnæus has arranged all the known genera of plants in twenty-five classes, and these again are subdivided into orders. The genera are distinguished by attending to the other parts of the fructification, as the calyx, corolla, pericarpium, &c. See the following TABLE.

ANALYSIS OF THE SEXUAL SYSTEM OF LINNÆUS.

According to this Method all Vegetables are furnished with FLOWERS, *which are either*

	CLASSES.	EXAMPLES.
Visible		
Stamina and pistillum in the same flower,		
Male and female organs distinct,		
Stamina not united either above or below,		
Of equal length,		
IN NUMBER,		
One, - - - - -	1 *Monandria,*	Ginger, Indian arrow-root, turmeric, blite.
Two, - - - - -	2 *Diandria,*	Jessamine, privet, olive, lilac, speedwell.
Three, - - -	3 *Triandria,*	Valerian, tamarind, iris, and the grasses.
Four, - - - -	4 *Tetrandria,*	Scabious, teazel, madder, holly, woodroof.
Five, - - - - -	5 *Pentandria,*	Bell-flower, bind-weed, mullein, thorn-apple, periwinkle, and the rough-leaved and umbelliferous plants.
Six, - - - - -	6 *Hexandria,*	Snow-drop, narcissus, tulip, hyacinth.
Seven, - - -	7 *Heptandria,*	Horse-chesnut.
Eight, - - -	8 *Octandria,*	Indian-cress, heath, French-willow.
Nine, - - -	9 *Enneandria,*	Bay rhubarb.
Ten, - - - - -	10 *Decandria,*	Fraxinella, rue, rhododendron, lychnis.
Twelve, - - -	11 *Dodecandria,*	Purslane, house-leek, asarabacca.
Many, frequently 20, attached to the calyx,	12 *Icosandria,*	Peach, medlar, apple, rose, cinquefoil.
Many, generally upwards of 20, not attached to the calyx,	13 *Polyandria,*	Herb christopher, poppy, larkspur, columbine.
Of unequal length,		
Two long & 2 short,	14 *Didynamia,*	Savory, hyssop, ground ivy, balm, toad-flax, fox-glove, agnus castus, bear's-breech.
Four long, & 2 short,	15 *Tetradynamia,*	Scurvy-grass, candy-tuft, water-cress, stock, woad.
Stamina united		
by the filaments, into one body,	16 *Monadelphia,*	Geranium, and the mallow tribe.
into two bodies,	17 *Diadelphia,*	Fumatory, milk-wort, and the pea-bloom flowers.
into many bodies,	18 *Polyadelphia,*	Orange, chocolate-nut, St. John's wort.
by the antheræ, or tops, into a cylinder,	19 *Syngenesia,*	Violet, balsam, cardinal-flower, and the flowers termed compound, as dandelion, succory, thistle, cudweed, tansey, blue-bottle.
Male organs (stamina) attached to, and standing upon the female (pistillum) -	20 *Gynandria,*	Orchis, ladies' slipper, arum, vanelloe, birth-wort, passion-flower.
Stamina and pisltillum in different flowers		
on the same plant, - - -	21 *Monœcia,*	Mulberry, nettle, oak, cypress, fir, cucumber.
on different plants, - - -	22 *Diœcia,*	Willow, hop, spinnach, poplar, mercury, juniper.
on the same, or on different plants along with hermaphrodite flowers,	23 *Polygamia,*	White hellebore, pellitory, orach, fig.
Or concealed, and not easily described	24 *Cryptogamia,*	Ferns, mosses, mushrooms, flags.

The principal merit of this system is its uniformity; the author never losing sight of the stamina, which are his leading and sole character. Its facility, which has been so highly extolled by some, will admit of a doubt; for in practice it has been thought by some botanists very intricate. None of the classes are completely natural, though some, particularly the 15th, 16th, 17th, 19th, and 20th, might have been rendered such without any material violence to the principles of the method.

In the following table the classes are distinctly exhibited, with the orders into which each class is subdivided. In plate X. the classes are all exhibited, and with each particular class some one of the orders.

TABLE OF THE CLASSES AND ORDERS.

CLASSES.	ORDERS.
1. Monandria	1. *Monogynia.* 2. *Digynia.*
2. Diandria	1. *Monogynia.* 2. *Digynia.* 3. *Trigynia.*
3. Triandria	1. *Monogynia.* 2. *Digynia.* 3. *Trigynia.*
4. Tetrandria	1. *Monogynia.* 2. *Digynia.* 3. *Tetragynia.*
5. Pentandria	1. *Monogynia.* 2. *Digynia.* 3. *Trigynia.* 4. *Tetragynia.* 5. *Pentagynia.* 6. *Polygynia.*
6. Hexandria	1. *Monogynia.* 2. *Digynia.* 3. *Trigynia.* 4. *Tetragynia.* 5. *Polygynia.*
7. Heptandria	1. *Monogynia.* 2. *Digynia.* 3. *Tetragynia.* 4. *Heptagynia.*
8. Octandria	1. *Monogynia.* 2. *Digynia.* 3. *Trigynia.* 4. *Tetragynia.*
9. Enneandria	1. *Monogynia.* 2. *Trigynia.* 3. *Hexagynia.*
10. Decandria	1. *Monogynia.* 2. *Digynia.* 3. *Trigynia.* 4. *Pentagynia.* 5. *Decagynia.*
11. Dodecandria	1. *Monogynia.* 2. *Digynia.* 3. *Trygynia.* 4. *Pentagynia.* 5. *Dodecagynia.*
12. Icosandria	1. *Monogynia.* 2. *Digynia.* 3. *Trigynia.* 4. *Pentagynia.* 5. *Polygynia.*
13. Polyandria	1. *Monogynia.* 2. *Digynia.* 3. *Trigynia.* 4. *Tetragynia.* 5. *Pentagynia.* 6. *Hexagynia.* 7. *Polygynia.*
14. Didynamia	1. *Gymnospermia.* 2. *Angiospermia.*
15. Tetradynamia	*Siliculosa.* 2. *Siliquosa.*
16. Monadelphia	1. *Triandria.* 2. *Pentandria.* 3. *Octandria.* 4. *Enneandria.* 5. *Decandria.* 6. *Endecandria.* 7. *Dodecandria.* 8. *Polyandria.*
17. Diadelphia	1. *Pentandria.* 2. *Hexandria.* 3. *Octandria.* 4. *Decandria.*
18. Polyadelphia	1. *Pentandria.* 2. *Icosandria.* 3. *Polyandria.*
19. Syngenesia	1. *Polygamia æqualis.* 2. *Polygamia superflua.* 3. *Polygamia frustanea.* 4. *Polygamia necessaria.* 5. *Polygamia segregata.* 6. *Monogamia.*
20. Gynandria	1. *Diandria.* 2. *Triandria.* 3. *Tetrandria.* 4. *Pentandria.* 5. *Hexandria.* 6. *Decandria.* 7. *Dodecandria.* 8. *Polyandria.*
21. Monœcia	1. *Monandria.* 2. *Diandria.* 3. *Triandria.* 4. *Tetrandria.* 5. *Pentandria.* 6. *Hexandria.* 7. *Heptandria.* 8. *Polyandria.* 9. *Monadelphia.* 10. *Syngenesia.* 11. *Gynandria.*
22. Diœcia	1. *Monandria.* 2. *Diandria.* 3. *Triandria.* 4. *Tetrandria.* 5. *Pentandria.* 6. *Hexandria.* 7. *Octandria.* 8. *Enneandria.* 9. *Decandria.* 10. *Dodecandria.* 11. *Polyandria.* 12. *Monadelphia.* 13. *Syngenesia.* 14. *Gynandria.*
23. Polygamia	1. *Monœcia.* 2. *Diœcia.* 3. *Triœcia.*
24. Cryptogamia	1. *Filices.* 2. *Musci.* 3. *Algæ.* 4. *Fungi.*
25.	1. *Palmæ.*

Delineations of the Classes and Orders.

Fig. 1. pl. X. Illustrates the class *Monandria*, and order *Monogynia*, (one stamen and one pistil) as in the *Canna Indica*, Indian flowering reed.

2. *Diandria Monogynia*, two stamens and one pistil, as in Veronica, or Speedwell.

3. *Triandria Digynia*, three stamens and two stigmata, as in the Grasses, &c.

4. *Tetrandria Monogynia*, four stamens and one pistil, as in many examples.

5. *Pentandria Monogynia*, five stamens and one style or pistil, as in the Hen-bane, &c.

6. *Hexandria Monogynia.*, six stamens and one

pistil, as in Tradescantia Virginiana, Spider-wort, &c.

7. *Heptandria Monogynia*, seven stamens and one style or pistil.

8. *Octandria Monogynia*, eight stamens and one style, as in Erica, Heath, &c.

9. *Enneandria Monogynia*, nine stamens, &c.

10. *Decandria Pentagynia*, ten stamens and five styles, as in Sedum, &c.

11. *Dodecandria Monogynia*, twelve stamens and one pistil.

12. *Icosandria Polygynia*, twenty stamens arising from the substance of the calyx or corolla, with many stigmata, as in *Geum*, *Water Avens*, &c.

13. *Polyandria Monogynia*, many stamens with one pistil or style, as in *Cistus*, Poppy, &c.

14. *Didynamia*, two stamens longer than the other two, as in *Lanuum*, Arch-angel, &c.

15. *Tetradynamia*,——six stamens, four longer than the other two.

16. *Monadelphia Pentagynia*, many stamens united at the base, and forming a cylinder with five stigmata, as in *Hibiscus Syriacus*, in the Mallow, &c.

17. *Diadelphia*,——the stamens in two parcels, as in the Pea, &c.

18. *Polyadelphia*,——many sets of stamens in one flower.

19. *Syngenesia*,——anthers united, as in the *Aster*, *Violet*, &c.

20. *Gynandria*,——stamens connected to the style, as in *Sisyrinchium*, &c.

21. *Monœcia*,——male and female flowers separate, but on the same plant.

22. *Diœcia*,——Plants of this class are either male or female, each distinct, and bearing from a separate root.

23. *Polygamia*,——Plants of this class bear *hermaphrodite*, together with distinct male and female flowers, or both.

24. *Cryptogamia*.——Plants of this kind have a concealed fructification, as in the *Filices*, Ferns, &c.

From this summary view of the *Sexual System* of Botany, it will be easily seen in what manner it is applied, in order to discover the genus and species of any unknown plant. When a plant is gathered in flower, the number of the stamina will refer to the CLASS, and the pistils to the ORDER, except in the twelve last classes, which are distinguished by other marks. When the order is found, the GENUS is next to be discovered, which is done by observing the *calyx*, the *corolla*, the *pericarpium*, and the *seeds*, as well as the form and situation of the *stamina* and *pistils*. The SPECIES are distinguished by some specific difference of the root, the trunk, the branches, or the leaves, and they are called by some trivial name, expressive of the specific difference, or some other circumstance; thus we find the *yellow* gentian, the *lesser* centaury, the *rough-leaved*, and the *smooth-leaved* witch elms, &c.

Parts of the Flower.—Pl. X. Fig. 1. shews a flower with its corolla, pistillum, and stamina, as just now described; *a*, the petals of the corolla; *b*, the germen; *c*, the style; *d*, the stigma; *e*, the filaments; *f*, the antheræ. Fig. 2. The calyx, pistillum, and stamina, separate from the corolla; *a*, the perianthium; *b*, the germen; *c*, the style; *d*, the stigma,; *e*, the filaments; *f*, the antheræ bursting and discharging the pollen; *g*, an anthera before it has burst. Fig. 3. A flower whose corolla is monopetalous; *a*, the corolla; *b*, the perianthium. Fig. 4. A polypetalous corolla; *a*, the ungues; *b*, the laminæ. Fig. 5. A *Narcissus* issuing from its spatha: *a*, the flower, *b*, the spatha. Fig. 6. An amentum. Fig. 7. The fructification of a *Moss; a*, the calyptra. Fig. 8. A *Fungus; a*, the volva. Fig. 9. A *Grass; a*, the gluma; *b*, the arista. Fig. 10. A compound umbel; *a*, the universal umbel; *b*, the umbellulæ, or partial umbels; *c*, the universal involucrum; *d*, the partial involucra. Fig. 11. A bractæa accompanying the flowers of the *Tilia: a*, the bractæa. Fig. 12, *a*, the pollen seen with a microscope; *b*, an elastic vapour discharged from it.

Parts of the Fruit.—Fig. 1. A capsule; *a*, the valvules. Fig. 2. *a*, A receptacle of seeds. Fig. 3. A strobilus. Fig. 4. A winged seed; *a*, the seed; *b*, the wing. Fig. 5. A legumen; *a*, the upper suture, along which runs the receptacle of the seeds. Fig. 6. A siliqua; *a*, *b*, the two sutures to which the seeds are fastened alternately. Fig. 7. A seed crowned with a pappus; *a*, the seed; *b*, the stipes or thread which supports the pappus; *c*, a hairy pappus; *d*, a feathery pappus. Fig. 8. The seed of a *bean* split in two; *a*, the cotyledons; *b*, the corculum; *c*, the rostellum; *d*, the plumula; *e*, the hilum. Fig. 9. A drupa; *a*, the nucleus, or stone; *b*, the pulp. Fig. 10. A pomum; *a*, the capsule; *b*, the pulp. Fig. 11. A berry; *a*, the seeds; *b*, the pulp. Fig. 12. A seed crowned with a calyculus; *a*, the seed; *b*, the calyculus.

Our necessary limits preclude a verbal explanation of the orders and their titles; but these may be found, with many other minutiæ of the science, in Lee's Introduction, or any other elementary book on the subject.

The *Structure of Plants* will be found described under the article PLANTS; but the several forms of the parts which compose them, are shewn in plates XI. XII. and XIII. of which the following are descriptions in the terms of Linnæus.

Delineations of Roots.

Plate XI. fig. 1. Shews a Squamose Bulb. 2. A Solid Bulb. 3. Transverse Section of a Tunicate Bulb. 4. A Pendulous Tuberose Root of the Fili-

pendula. 5. A Ramose Root. 6. A Fusiform Root. 7. A Repent Root.

Trunks.

Fig. 1. A Squamose Culm. 2. A Repent Stem. 3. A Frons. 4. A Voluble Stem. 5. An Articulate Culm. 6. A Scapus. 7. A Dichotomous Stem. 8. A Brachiate Stem.

Fulcra.

Fig. 1. *a*, A Cirrhus. *b*, Stipulæ. *c*, Concave Glandules. Fig. 2. *a*, Pedicellate Glandules. Fig. 3, *a*, Bracteæ differing from the Leaves. *b*, The Leaves. Fig. 4. *a*, Simple Spines. *b*, A Triple Spine. Fig. 5. *a*, Simple Aculei. *b*, Triple Aculei, or Forks. Fig. 6. *a*, Opposite Leaves. *b*, The Axillæ.

Simple Leaves

Plates XII. and XIII.—Fig. 1. Orbiculate. 2. Subrotund. 3. Ovate. 4. Oval. 5. Oblong. 6. Lanceolate. 7. Linear. 8. Subulate. 9. Reniform. 10. Cordate. 11. Lunulate. 12. Triangular. 13. Saggittate. 14. Cordato-sagittate. 15. Hastate. 16. Fissa. 17. Trilobe. 18. Præmorse. 19. Lobate. 20. Quinquangular. 21. Erose. 22. Palmate. 23. Pinnatifid. 24. Laciniate. 25. Sinuate. 26. Dentato-sinuate. 27. Retrorsum-sinuate. 28. Partite. 29. Repand. 30. Dentate. 31. Serrate. 32. Duplicato-serrate. 33. Duplicato-crenate. 34. Cartilagincous. 35. Acutely-crenate. 36. Obtusely-crenate. 37. Plicate. 38. Crenate. 39. Crisp. 40. Obtuse. 41. Acute. 42. Acuminate. 43. Obtuse with an acumen. 44. Acutely-emarginate. 45. Cunciform-emarginate. 46. Rctuse. 47. Pilose. 48. Tomentose. 49. Hispid. 50. Ciliate. 51. Rugose. 52. Venose. 53. Nervose. 54. Papillose. 55. Linguiform. 56. Acinaciform. 57. Dolabriform. 58. Deltoid. 59. Triquetrous. 60. Canaliculate. 61. Sulcate. 62. Teretes. 63. Parabolic. 64. Spatulate.

Compound Leaves.

Fig. 1. Binate. 2. Ternate, with the folioles sessile. 3. Ternate, with the folioles petiolate. 4. Digitate. 5. Pedate. 6. Pinnate with an odd one. 7. Pinnate abrupt. 8. Pinnate alternately. 9. Pinnate interruptedly. 10. Pinnate cirrhose. 11. Pinnate conjugate. 12. Pinnate decursivcly. 13. Pinnate articulately. 14. Lyrate (this belongs to the Simple Leaves). 15. Biternate. 16. Bipinnate. 17. Triternate. 18. Tripinnate abrupt. 19. Tripinnate with an odd one.

Determinate Leaves.

Fig. 1. *a*, Inflex. *b*, Erect. *c*, Patent. *d*, Horizontal. *e*, Reclined. *f*, Revolute. Fig. 2. *a*, Seminal. *b*, Cauline. *c*, Rameous. *d*, Floral. Fig. 3. *a*, Peltate. *b*, Petiolate. *c*, Sessile. *d*, Dccurrent. *e*, Amplexicaul. *f*, Perfoliate. *g*, Connate. *h*, Vaginant. Fig. 4. *a*, Articulate. *b*, Stellate. *c*, Quartern. *d*, Opposite. *e*, Alternate. *f*, Acerose. *g*, Imbricate. *h*, Fasciculate.

Foliation.

Fig. 1. Convolute. 2. Involute. 3. Revolute. 4. Conduplicate. 5. Equitant. 6. Imbricate. 7. Obvolute. 8. Plicate. 9. Convoluta (more than one leaf convolute). 10. Involute opposite. 11. Involute alternate. 12. Revolute opposite. 13. Equitant ancipit (with two prominent angles). 14. Equitant triquetrous (forming a triangle).

Pl. XIV. exhibits some of the miscellaneous parts of botany. Fig. 1. is a Corymbus. 2. An Arillus exemplified in the Euonymus: *a*, the Valvules of the Capsule; *b*, a Seed; *c*, the Arillus opened to discover the Seed. 3. A Verticillus. 4. *a*, The horned Nectaria in *Aconitum*; *b*, two Peduncles or Styles that support them. 5. A paleaceous Receptacle of a compound Flower shewn in *Rudbeckia*; *a*, the Paleæ that part the Florets of the Disk; *b*, the tubulose Florets of the Disk; *c*, the ligulate Corollulæ of the Radius; *d*, a ligulate Corollula fallen off. 6. *a*, A Spatha; *b*, a Spadix. 7. A Racemus. 8. A tubulose Floret of a compound Flower. 9. A monopetalous hypocrateriform Corolla: *a*, the Tube: *b*, the Limb. 10. A Nectarium that crowns the Corolla shown in the Cup of a *Narcissus*; *a*, the Cup or Nectarium. 11. A Spike. 12. A calcyne Nectarium shown in the Flower of a *Tropæolum*; *a*, the Nectarium. 13. A Nectarium of singular construction, shewn in a Flower of the *Parnassia*; *a*, five heart-shaped Nectaria terminated by Styles or Threads, each of which is crowned with a little Ball. 14. A Cyma of the *Laurustinus*. 15. A Panicle.

The terms used in these descriptions, are shortly explained under their individual articles.

Notwithstanding the evident superiority of the sexual system over all others, Linnæus and most other modern botanists are of opinion, that there is a *natural method*, or nature's system, which we should diligently endeavour to find out. That this system, say they, is no chimera, as some imagine, will appear particularly from hence, that all plants, of what order soever, show an affinity to some others; and thus, as formerly observed, not only the virtues of a great number of species may be ascertained, but we may know with certainty how to find proper succedanea for plants which cannot easily be had.—Linnæus divides vegetables into fifty-eight natural methods, which are numbered in the following way:

1st. *Palmæ*. 2d. *Piperitæ*. 3rd. *Calamariæ*. 4th. *Gramina*. 5th. *Tripetaloideæ*. 6th. *Ensatæ*. 7th.

Orchideæ. 8th, *Scitamineæ.* 9th, *Spathaceæ.* 10th, *Coronariæ.* 11th, *Sarmentosæ.* 12th, *Holeraceæ.* 13th, *Succulentæ.* 14th, *Gruinales.* 15th, *Inundatæ.* 16th, *Calyciflorœ.* 17th, *Calycanthemæ.* 18th, *Bicornes.* 19th, *Hesperideæ.* 20th, *Rotaceæ.* 21st, *Preciæ.* 22nd, *Caryophylleæ.* 23d. *Trihilatæ.* 24th, *Corydales.* 25th, *Putamineæ.* 26th, *Multisiliquæ.* 27th, *Rhoeadeæ.* 28th, *Luridæ.* 29th, *Campanaceæ.* 30th, *Contortæ.* 31st, *Vepreculæ.* 32nd, *Papilionaceæ.* 33rd, *Lomentaceæ.* 34th, *Cucurbitaceæ.* 35th, *Senticosæ.* 36th, *Pomaceæ.* 37th, *Columniferæ.* 38th, *Tricoccæ.* 39th, *Siliquosæ.* 40th, *Personatæ.* 41st, *Asperifoliæ.* 42nd, *Verticillatæ.* 43rd, *Dumosæ.* 44th, *Sepiariæ.* 45th, *Umbellatæ.* 46th, *Hederaceæ.* 47th, *Stellatæ.* 48th, *Aggregatæ.* 49th, *Compositæ.* 50th, *Amentaceæ.* 51st, *Coniferæ.* 52nd, *Coadunatæ.* 53rd, *Scabridæ.* 54th, *Miscellaneæ.* 55th, *Filices.* 56th, *Musci.* 57th, *Algæ.* 58th, *Fungi.* See these Articles.

Under the name *Dubii ordinis* Linnæus classes all the other genera which cannot be reduced to any of the abovementioned orders, and which are near 120 in number, as may be seen by referring to his *Fragmenta Methodi Naturalis.* In his *Philosophia Botanica* he has made a general division of vegetables according to their natural order, into the seven families or tribes following, viz. 1. *Fungi*, Mushrooms. 2. *Algæ*, Flags; whose root, leaf, and stem are all one. 3. *Musci*, Mosses; whose antheræ have no filaments, and are placed at a distance from the female flower, and whose seeds also want their proper tunic and cotyledons. 4. *Filices*, Ferns; whose fructification is on the back of the frondes. 5. *Gramina*, Grasses; which have simple leaves, a jointed culm or stem, a glumose calyx, and a single seed. 6. *Palmæ*, Palms; which have simple stems that are frondose at the summit, and have their fructification on a spadix issuing from a spatha. 7. *Plants*, which include all that do not enter into any of the other divisions. These last are said to be *herbaceous*, when they die down to the root every year; for in the perennial kinds, the buds are all produced on the root below the surface of the ground. They are named *shrubs*, when their stems come up without buds; and *trees*, when their stems come up with buds. See PLANTS.

BOTANY, MEDICAL, that part of the science of botany which relates exclusively to the vegetables employed in medicine. Dr. Woodville very justly observes, that, in the catalogues of the Materia Medica, both of the Edinburgh and London Colleges, the productions of the animal and mineral kingdoms bear a small proportion to those of the vegetable, and though it must be acknowledged, that, for some time past, the medicinal uses of vegetable simples have been less regarded by physicians than they were formerly, which probably may be ascribed to the successive discoveries and improvements in chemistry, it would be difficult to show that this preference is supported by any conclusive reasoning drawn from a comparative superiority of Chemicals over Galenicals, or that the more general use of the former has actually led to a more successful practice.

Although what may be called the herbaceous part of the Materia Medica, as now received in the British pharmacopœias, comprises but a very inconsiderable portion of the vegetable world; yet limited as it now is, few medical practitioners have a distinct botanical knowledge of the individual plants of which it is composed, though generally well acquainted with their effects and pharmaceutical uses. But the practitioner, who is unable to distinguish those plants which he prescribes, is not only subjected to the impositions of the ignorant and fraudulent, but must feel a dissatisfaction which the inquisitive and philosophic mind will be anxious to remove; and to such, an attention to the study of *Medical Botany*, which is only the application of the system of general botany to the plants employed in medicine, is too obviously important to need any strong recommendation, as it will enable him to distinguish with precision all those plants which are directed for medicinal use by the Colleges, and make him acquainted, at the same time, with their respective virtues.

A distinctive and characteristic knowledge of natural objects should certainly precede the consideration of their different properties and qualities; and with respect to plants, this knowledge is seldom to be adequately attained by a mere verbal description: hence accurate delineations should be resorted to as well as the examination of the plants themselves at those seasons when they are in perfection.

It is justly a matter of surprise, that notwithstanding the universal adoption of the Linnæan system of Botany, and the great advances made in natural science, the works of Blackwell and Sheldrake should so long have been the only books in this country in which copper-plate figures of the medicinal plants are professedly given; while splendid foreign publications of them, by Regnault, Zorn, and Plenck, have appeared in the space of a very few years. These latter works, however, are far from superseding the more excellent work of Dr. Woodville, since that author has exhibited icons of several rare and valuable plants, which were never completely figured in any preceding work. He has also subjoined some account of the botanical and medical history of each species, by which curiosity is more fully gratified, and a double interest excited in the mind of the student.

Respecting the uses of simples, the opinion of Oribasius will not be disputed, viz. "*Simplicium medicamentorum, & facultatum quæ in eis insunt,*

cognitio ita necessaria est, ut sine ea nemo rite medicari queat:" and it is a lamentable truth, that our experimental knowledge of many of the herbaceous simples is extremely defective; for as writers on the Materia Medica have usually done little more than copy the accounts given by their predecessors, the virtues now ascribed to several plants are wholly referable to the authority of Dioscorides. The medical reader, however, will now find what relates to this subject as complete as the slow progressive state of experience in physic will admit; Dr. Woodville having, with this intention, industriously collected facts and opinions from various authorities; particularly from Professor Murray, and the works of the late Dr. Cullen.

A Systematic Arrangement of the VEGETABLE MATERIA MEDICA, *according to the* LINNÆAN *System.*

Class I. MONANDRIA.
Order *Monogynia.*
AMOMUM zingiber.
— cardamomum.
— granum paradisi.
Costus arabicus.
Maranta galanga.
Curcuma longa.
Kaempferia rotunda.

Class II. DIANDRIA.
Order *Monogynia.*
Jasminum officinale.
Olea Europæa.
Veronica officinalis
— beccabunga.
Gratiola officinalis.
Verbena officinalis.
Monarda fistulosa.
Rosmarinus officinalis.
Salvia officinalis.
— horminum.
— sclarea.
Collinsonia canadensis.

Trigynia.
Piper nigrum.
— longum.
— cubeba.
— betel.

Class III. TRIANDRIA.
Order *Monogynia.*
Valeriana officinalis.
— phu.
— celtica.
Tamarindus indica.
Crocus sativus.
Iris florentina.
— tuberosa.
— Germanica.
— pseudacorus.
— fœtidissima.
Gladiolus communis.
Cyperus longus.
— rotundus.

Digynia.
Arundo phragmitis.
Saccharum officinarum.
Phalaris canariensis.
Panicum italicum.
— dactylon.
— miliaceum.
Avena sativa.
Secale cereale.
Hordeum distichon.
Triticum hybernum.
— Repens.

Class IV. TETRANDRIA.
Order *Monogynia.*
Globularia alypum.
Dipsacus fullonum.
Scabiosa succisa.
— arvensis.
Asperula odorata.
Galium verum.
— mollugo.
— aparine.
Rubia tinctorum
Penæa sarcocolla.
Pantago major.
— media.
— lanceolata.
— psyllium.
Fagara octandra.
Hediotis auricularia.
Sanguisorba officinalis.
Banksia abyssinica.
Trapa natans.
Dorstenia contrayerva.
Santalum album.
Camphorosma Monspeliensis.
Alchemilla vulgaris.

Digynia.
Cuscuta Europæa.
Cuscuta epithymum.

Tetragynia.
Ilex aquifolium.
— cassine.

Class V. PENTANDRIA.
Order *Monogynia.*
Lithospermum officinal.
Anchusa officinalis.
— tinctoria.
Cynoglossum officinale.
Pulmonaria officinalis.
Symphytum officinale.
Borago officinalis.
Primula veris.
Soldanella alpina.
Cyclamen Europæum.
Menyanthes trifoliata.
Lysimachia mummularia.
Anagallis arvensis.
Spigelia anthelmintica.
— marilandica.
Ophiorrhiza mungos.
Onosma echioides.
Plumbago Europæa.
Convolvulus scammonia.
— turpethum.
— Jalapa.
— mechoacanna.
— soldanella.
Cinchona officinalis.
— carybæa.
— angustifolia.
— corymbifera.
— floribunda.
— montana.
— tecamez.
Coffea Arabica.
— occidentalis.
Psychotria emetica.
Lonicera periclymenum.
— symphoricarpos.
— diervilla.
Verbascum thapsus.
— nigrum.
Datura stramonium.
Hyoscyamus niger.
— albus.
Nicotiana tabacum.
Atropa mandragora.
— belladonna.
Physalis alkekengi.
Solanum dulcamara.
— nigrum.
Capsicum annuum.
— baccatum.
Strychnos nux vomica.
— colubrina?
— volubilis?
— atia amara?
Coris Monspelliensis.
Cordia mixa.
Rhamnus catharticus.
— frangula.
— zizyphus.
Ceanothus Americanus.
Ribes rubrum.
— nigrum.
Hedera helix.
Vitis vinifera.
— apyræna.
Lagoecia cuminoides.
Allamanda cathartica.
Vinca minor.
Nerium antidysenteric.
Plumeria alba.
Echites syphilitica.

Digynia.
Asclepias asthmatica.
— vincetoxicum.
Herniaria glabra.
Chenopodium bonus henricus.
— rubrum.
— botrys.
— ambrosioides.
— anthelminticum.
— vulvaria.
Beta vulgaris.
— cicla.
Salsola kali.
— sativa.
— soda.
Ulmus campestris.

Gentiana lutea.
— asclepeidea.
— centaurium.
— purpurea.
— cruciata.
— amarella.
Eryngium campestre.
Sanicula Europæa.
Bupleurum rotundifolium.
Tordylium officinale.
Daucus carota.
Conium maculatum.
Cachris odontalgica.
Athamanta annua.
— oreoselinum.
Peucedanum officinale.
Ferula assa fœtida.
Laserpitium filer.
— latifolium.
Heracleum spondilium.
Ligusticum levisticum.
Angelica archangelica.
— sylvestris.
Sium ninsi.
— nodiflorum.
Sison amomum.
Ammi majus.
Bubon macedonicum.
— galbanum.
Cuminum cyminum.
Œnanthe crocata.
Phellandrium aquaticum.
Cicuta virosa.
Æthusa meum.
Coriandrum sativum.
Scandix cerefolium.
Chærophyllum sylvestre.
Imperatoria ostruthium.
Seseli tortuosum.
Pastinaca sativa.
— opopanax.
Anethum graveolens.
— Fœniculum.
Carum carui.
Pimpinella saxifraga.
— magna.
— anisum.
Apium petroselinum
— graveolens.

Trigynia.
Semecarpus anacardium.
Rhus coriaria.
— typhinum.
— vernix.
Cassine peragua.
Sambucus ebulus.
— nigra.

Tamarix gallica.
Alsine media.

Tetragynia.
Parnassia palustris.

Pentagynia.
Statice limonium.
Linum usitatissimum.
— catharticum.
Drosera rotundifolia.

Class VI. Hexandria.
Order *Monogynia.*
Bromelia ananas.
Allium victoriale.
— sativum.
— porrum.
— cepa.
Lilium candidum.
Scilla maritima.
Asphodelus ramosus.
Asparagus officinalis.
Dracæna draco.
Convallaria majalis.
— polygonatum.
Aloë perfoliata.
Bursera gummifera.
Acorus calamus.
Calamus rotang.
Achras sapota.
Berberis vulgaris.

Digynia.
Oryza sativa.

Trigynta.
Rumex crispus.
— sanguineus.
— patientia.
— acutus.
— hydrolapathum.
— scutatus.
— alpinus.
— acetosa.
Colchicum autumnale.
— illyricum.

Tetragynia.
Petivera alliacea.

Class VII. Heptandria.
Order *Monogynia.*
Æsculus hyppocastanum.

Class VIII. Octandria.
Order *Monogynia.*
Tropæolum majus.
Amyris elemifera.
Amyris gileadensis.
— opobalsamum.
— zeylanica.
— kataf.
Lawsonia inermis.
Vaccinium myrtillus.
— vitis idæa.
— oxycoccos.
Daphne mezereum.
— thymelæa.
— laureola.
— gnidium.

Trigynia.
Polygonum fagopyrum.
— bistorta.
— hydropiper.
— persicaria.
— aviculare.
Sapindus saponaria.

Tetragynia.
Paris quadrifolia.

Class IX. Enneandria.
Order *Monogynia.*
Laurus cinnamomum.
— cassia.
— myrrha?
— camphor.
— culilawan.
— nobilis.
— sassafras.
— pecurim.
Anacardium occidentale.

Trigynia.
Rheum palmatum.
— rhaponticum.
— undulatum.

Class X. Decandria.
Order *Monogynia.*
Sophora heptaphylla.
Hymenæa courbaril.
Cassia fistula.
— senna.
Poinciana pulcherrima.
Cæsalpinia sappan.
— crista.
Myroxylon peruiferum.
Guilandina moringa.
Guajacum officinale.
— sanctum.
Dictamnus albus.
Ruta graveolens.
Toluifera balsamum.
Hæmatoxylum campechianum.
Swietenia mahogani.
— febrifuga.
Quassia amara.
— simaruba.
— dioica?
Ledum palustre.
Rhododendron chrysanthum.
— ferrugineum.
Arbutus uva ursi.
Pyrola rotundifolia.
Styrax officinalis.
— Benzoin.
Copaifera officinalis.

Digynia.
Saxifraga granulata.
— crassifolia.
Saponaria officinalis.
Dianthus caryophillus.

Pentagynia.
Sedum telephium.
— acre.
Oxalis acetosella.
— cernua.
— corniculata.

Decagynia.
Phytolacca decandra.

Class XI. Dodecandria.
Order *Monogynia.*
Asarum Europæum.
Canella alba?
Portulaca oleracea.
Lythrum salicaria.
Garcinia mangostana.

Digynia.
Agrimonia eupatoria.

Trigynia.
Euphorbia officinarum.
— canescens.
— parviflora.
— esula.
— Lathyris.
— palustris.

Dodecagynia.
Sempervivum tectorum..

Class XII. Icosandria.
Order *Monogynia.*
Cactus opuntia.
Myrtus communis.
— caryophyllata.
— pimenta.

Punica granatum.
Amygdalus communis.
— nana.
— persica.
Prunus avium.
— cerasus.
— domestica.
— lauro-cerasus.
— padus.
— spinosa.

Trigynia.
Sorbus aucuparia.
— domestica.

Pentagynia.
Mesembryanthemum crystallinum.
Mespillus germanica.
Pyrus malus.
— cydonia.
Spiræa filipendula.
— ulmaria.

Polygynia.
Rosa alba.
— canina.
— centifolia.
— damascena.
— gallica.
Rubus arcticus.
— chamæmorus.
— idæus.
Fragaria vesca.
Potentilla anserina.
— reptans.
Tormentilla erecta.
Geum rivale.
— urbanum.

Class XIII. Polyandria.
Order *Monogynia.*
Capparis spinosa.
Chelidonium majus.
Papaver rhœas.
— somniferum.
Cambogia gutta.
Nymphæa alba.
Bixa orellana.
Tilia Europæa.
Myristica officinalis.
Thea bohea.
— viridis.
Caryophillus aromaticus.
Cistus creticus.

Digynia.
Pæonia officinalis.

Trigynia.
Delphinium consolida.
— staphisagria.
Aconitum anthora.
— cammarum.
— napellus.

Tetragynia.
Cimicifuga fœtida.

Pentagynia.
Aquilegia vulgaris.
Nigella sativa.

Polygynia.
Illicium anisatum.
Uvaria zeylanica.
Liriodendron tulipifera.
Anemone hepatica.
— nemorosa.
— pratensis.
Clematis recta.
— vitalba.
Thalictrum flavum.
Ranunculus abortivus.
— acris.
— alpinus.
— arvensis.
— bulbosus.
— ficaria.
— flammula.
— illyricus.
— lingua.
— sceleratus.
— thora.
Helleborus fœtidus.
— niger.
— viridis.
Wintera aromatica.
— canella.
Adonis verna.
— appenina.

Class XIV. Didynamia.
Order *Gymnospermia.*
Ajuga pyramidalis.
Tencrium chamædrys.
— chamæpitys.
— creticum.
— marum.
— polium.
— scordium.
Satureja capitata.
— hortensis.
Hyssopus officinalis.
Nepeta cataria.
Lavandula spica.
— stœchas.
Mentha auricularis.
— cervina.
Mentha crispa.
— piperita.
— pulegium.
— sativa.
— sylvestris.
— viridis.
Glecoma hederacea.
Lamium album.
Betonica officinalis.
Stachys annua.
— recta.
— sylvatica.
Marrubium vulgare.
Leonurus cardiaca.
Origanum creticum.
— dictamnus.
— majorana.
— syriacum.
— vulgare.
Thymus serpillum.
— vulgaris.
Melissa calaminthus.
— officinalis.
Dracocephalum Canariensé.
— Moldavicum.
Melittis melissophyllum.
Ocymum basilicum.
Prunella vulgaris.
Scutellaria galericulata.

Angiospermia.
Acanthus mollis.
Euphrasia officinalis.
Lathræa squammaria.
Pedicularis palustris.
Antirrhinum linaria.
Scrophularia aquatica.
— nodosa.
Digitalis purpurea.
Linnæa borealis.
Sesamum orientale.
Vitex agnus castus.
Avicennia tomentosa.
Bignonia ophthalmica.

Class XV. Tetradynamia.
Order *Siliculosa.*
Lepidium sativum.
Thlaspi arvense.
— bursa pastoris.
Cochlearia armoracia.
— officinalis.

Siliquosa.
Dentaria pentaphyllos.
Cardamine pratensis.
Sisymbrium nasturtium.
Sisymbrium sophia.
— tenuifolium.
Erysimum aliaria.
— barbarea.
— officinale.
Cheiranthus cheiri.
Brassica eruca.
— oleracia.
— rapa.
Sinapis alba.
— nigra.
Raphanus sativus.
Crambe orientalis.

Class XVI. Monadelphia.
Decandria.
Geranium moschatum.
— robertianum.

Dodecandria.
Pentapetes muhucunda.

Polyandria.
Althæa officinalis.
Alcea rosea.
Malva alcea.
— rotundifolia.
— sylvestris.
Gossypium herbaceum.
Hibiscus abelmoschus.

Class XVII. Diadelphia.
Hexandria.
Fumaria bulbosa.
— officinalis.

Octandria.
Polygala amara.
— senega.
— vulgaris.

Decandria.
Pterocarpus draco.
— santalinus.
Spartium scoparium.
Genista canariensis?
— tinctoria.
Ononis spinosa.
— arvensis.
Lupinus albus.
Phaseolus vulgaris.
Dolichos pruriens?
— urens?
— foja.
Vicia faba.
Glycyrrhiza glabra.
— echinata.

Cytisus laburnum.
Ervum ervilia.
— lens.
Pisum sativum.
Geoffroya inermis.
— Surinamensis.
Indigofera tinctoria.
Galega officinalis.
Astragalus exscapus.
— gummifer.
— tragacantha.
Trifolium melilotus officinalis.
— repens.
Trigonella Monspellien.
— fœnum græcum.

Class XVIII. Polyadelphia.
Pentandria.
Theobroma cacao.

Icosandria.
Citrus medica.
— aurantium.

Polyandria.
Melaleuca leucadendron.
Hypericum bacciferum.
— guttiferum ?
— perforatum.

Class XIX. Syngenesia.
Polygamia æqualis.
Tragopogon pratense.
Scorzonera Hispanica.
— humilis.
Lactuca sativa.
— scariola.
— virosa.
Sonchus oleraceus.
Leontodon taraxacum.
Hieracium pilosella.
Cichorium intybus.
— endivia.
Arctium lappa.
Serratula amara.
Carduus marianus.
Onopordum acanthium.
Cynara scolymus.
Carlina acaulis.
Carthamus tinctorius.
Spilanthus acmella.
Eupatorium cannabium.
Santolina chamæcyparissus.

Polygamia superflua.
Tanacetum vulgare.
Artemisia balsamica.
— abrotanum.
— absynthium.
— campestris.
— dracunculus.
— glacialis.
— maritima.
— pontica.
— rupestris.
— santonica.
— vulgaris.
Gnaphalium arenarium.
— dioicum.
Erigeron acre.
Tussilago farfara.
— petasites.
Senecio vulgaris.
Solidago virga aurea.
Inula helenium.
— dysenterica.
Arnica montana.
Doronicum latifolium.
— pardalianches.
Bellis perennis.
Chrysanthemum leucanthemum.
Matricaria chamomilla.
— parthenium.
Anthemis cotula.
— nobilis.
— pyrethrum.
Achillea ageratum.
— atrata.
— millefolium.
— moschata.
— ptarmica.
Sigesbeckia orientalis.

Polygamia frustranea.
Centaurea behen.
— benedicta.
— calcitrappa.
— cyanus.

Polygamia necessaria.
Calendula officinalis.

Monogynia.
Lobelia syphilitica.
— longiflora.
— tupa.
Viola canina.
— ipecacuanha.
— odorata.
— tricolor.

Class XX. Gynandria.
Diandria.
Orchis bifolia.
Orchis mascula.
— militaris.
— morio.
Satyrium hircinum.
Epidendrum vanilla.

Hexandria.
Aristolochia anguicida
— clematitis.
— longa.
— rotunda.
— odoratissima.
— serpentaria.
— trilobata.

Dodecandria.
Cytinus hypocistis.

Polyandria.
Arum maculatum.
Zostera marina.

Class XXI. Monœcia.
Monandria.
Cynomorium coccineum.

Triandria.
Carex arenaria.
Phyllanthus emblica.

Tetandria.
Betula alba.
— alnus.
Buxus sempervirens.
Urtica dioica.
— pilulifera.
— urens.
Morus nigra.

Pentandria.
Xanthium strumarium.

Polyandria.
Poterium sanguisorba.
Quercus robur.
— cerris.
— suber.
Juglans regia.
Fagus castanea.
— sylvatica.
Corylus avellana.
Liquidambar styraciflua.

Monadelphia.
Pinus abies.
— balsamea.
— canadensis.
— cembra.
— larix.
Pinus picea.
— pinea.
— sylvestris.
— munglos.
Stillingia sylvatica.
Cupressus sempervirens.
Thuja occidentalis.
— articulata.
Croton cascarilla.
— lacciferum.
— tiglium
— tinctorium:
Jatropha curcas.
— elastica.
— manihot.
Ricinus communis.

Syngenesia.
Momordica elaterium.
Cucurbita lagenaria.
— citrullus.
— pepo.
Cumumis colocynthis.
— melo.
— sativus.
Bryonia alba.

Class XXII. Diœcia.
Diandria.
Salix alba.
— caprea.
— fragilis.
— pentandria.
— vitulina.

Triandria.
Excœcaria agallocha.

Tetrandria.
Viscum album.
Myrica gale.
Brucea ferruginea, a. antidysenterica.

Pentandria.
Pistacia vera.
— terebinthus.
— chio.
— lentiscus.
Spinacea oleacea.
Cannabis sativa.
Humulus lupulus.
Fevillea trilobata.

Hexandria.
Smilax sarsaparilla.
— china.

Octandria.
Populus nigra

Populus balsamifera.
Rhodiola rosea.

Enneandria.
Mercurialis annua.

Decandria.
Carica papaya.

Dodecandria.
Menispermum cocculus.

Monodelphia.
Juniperus sabina.
— communis.
— Lycea?
Cissampelos pareira.
— caapeba.

Syngenesia.
Ruscus aculeatus.
— hypoglossum.

Gynandria.
Clutia eluteria?

Class XXIII. Polygamia.
Monœcia.
Veratrum album.
— nigrum.
— sabadilla?
Andropogon schœnanthus.
— nardus.
Parietaria officinalis.
Ophioxylum serpentinum
Mimosa catechu.
— nilotica.
— senegal.

Diœcia.
Fraxinus excelsior.
— ornus.
— rotundifolia.
Panax quinquefolium.

Triœcia.
Ceratonia siliqua.
Ficus carica.
— indica.

Ficus religiosa.

Class XXIV. Cryptogamia.
Filices.
Equisetum arvense.
Osmunda regalis.
Pteris aquilina.
Asplenium ceterach.
— ruta muraria.
— scolopendria.
— trichomanoides.
Polypodium vulgare.
— filix mas.
— fragrans.
Adianthum capillus veneris.
— pedatum.

Musci.
Lycopodium clavatum.
— selago.
Polytrichum commune.

Algæ.
Lichen aphthosus.
Lichen caninus.
— cocciferus.
— islandicus.
— plicatus.
— pulmonarius.
— roccella.
Conferva rivularis.
— helminthocorton.
Fucus vesiculosus.

Fungi.
Agaricus muscarius.
Boletus laricinus.
— igniarius.
— suaveolens.
Peziza auricula.
Lycoperdon bovista.
— tuber.

Class XXV. Palmæ.
Cocos butyracea.
— nucifera.
Phœnix dactylifera.
Sagus farinaria.

BO'THOR, a word which has three significations among the Arabian physicians. 1. It denotes tumors in general. 2. A tumor with a solution of continuity. And, 3. Small tumors; which last is the most proper. Some take it for an abscess of the nostrils. Blancard says it signifies pimples in the face, which do not spread, but are easily suppurated, and vanish. It is, besides, a general appellation for pimples in the face, lungs, or other parts; and the Arabians call the small pox and measles by this name.

BO'TRYS, oak of Jerusalem. A species of *Chenopodium.*

BO'TRYS, a species of *Teucrium.*

BO'TRYS MEXICA'NA, Mexican tea.

BOTRYI'TES, (βοτρυιτις, from βοτρυς, *a cluster*, properly of grapes). It is a sort of burnt cadmia, resembling a cluster of grapes, and, collected from the upper part of the furnace, where it is burnt; as what is collected in the lower part is called *placitis.* Schroder says, that the *botryites* is collected in the middle part of the furnace, the *placitis* in the upper, and the *ostracitis* in the lowest.

BOU'BON, in the old writers, sometimes signifies the groin, sometimes the glands in the groin, and a tumor of the same; also, a humour in the neck or arm-pits, or behind the ears, or of any of the external glandular parts. From *boubon* the term *bubo* is taken. See Bubo.

BOUGI'E, a flexible instrument, or *wax candle*, as its name denotes, employed by surgeons in the cure of strictures in the urethra (See Stricture). Bougies act solely by pressure, and by dilating the part; hence they should be so large as to fill the passage, and sufficiently flexible to be easily introduced. They have been prepared from various receipts which it is scarcely worth while to enumerate; the ingredients being, for the most part, alike, but differing in their proportions. We shall therefore confine our account to the following compositions, the former of which is recommended by Mr. Hunter.

℞ Olei olivæ lib. iij.
Ceræ flavæ lib. j.
Minii lib. iss.

These are to be boiled together over a slow fire for six hours. Bougies made with this composition will be found much too soft for immediate use, but after keeping some months, will acquire sufficient firmness. If this be an objection, however, it may easily be removed, and the plaster made of a stiffer consistence, by adding two or three ounces more wax, and the like quantity of minium, and continuing the boiling till the latter is dissolved.

Bougies ought to be smooth and supple, and yet of sufficient firmness to admit of being pretty strongly urged by the hand of the surgeon, without bending or twisting in the urethra. They are formed of narrow slips of thin linen rag, which, after being equally dipped into the melted composition, are firmly folded up and afterwards rolled on a marble slab, till their surface is perfectly uniform. Their shape should be nearly equal except towards the point, which should taper very gradually for about the length of an inch.

A tolerably good composition for bougies may also be formed with litharge plaster and yellow wax, to which may be added a small quantity of red sulphurated quicksilver. The following formula is from Swediaur:

℞ Ceræ flavæ lib. j.
Spermatis ceti drach. iij.
Cerussæ acetatæ drach. ij. ad viij.

These are to be boiled together as in the former instance, and the proportion of acetated ceruse regulated according as the bougies are designed to be of a firmer or a weaker consistence. When of a large size they should always be of the latter description, that they may the more readily conform to the shape of the passage when introduced.

Mr. Bell has given us the following still more simple formula for the composition of bougies:

℞ Emplastri lithargyri unc. iv.
Ceræ flavæ unc. iss.
Olei olivæ drach. iij.

We are directed to melt the wax and oil in one vessel, and the litharge plaster in another, and afterwards to mix them together. Possibly by this precaution, and by melting the plaster very gradually, we may prevent the great number of air-bubbles which generally are let loose in this kind of composition, and which prove extremely inconvenient in dipping the strips of linen equally.

Bougies are likewise formed of catgut, a substance well calculated to penetrate a strictured part in the first instance, as it admits of being made smaller than the plaster bougie, and yet possesses a sufficient degree of elasticity and strength to allow of being pushed forward with some force. Catgut bougies are also well calculated to pass through an aperture which takes a winding sort of direction, a case in which the common bougie very frequently fails. They do less, however, towards *dilating* the stricture than is generally supposed, as they soon become soft and flabby, and in that state, rather yield to the pressure of the stricture, than produce the effect of dilating it.

Another invention, in which catgut is involved in elastic gum, is perhaps one of the greatest improvements lately made in the composition of simple bougies. The gum defends the catgut from the moisture of the part whilst the latter offers a sufficient resistance to the strictured part.

There are also *flexible metallic bougies*, a late invention of Mr. Smyth, an apothecary, in London, who, in the following terms, recommends "two kinds of bougies, which, for smoothness, firmness, and pliability, will be found, by comparison, superior to any that are at present in use. The first of these are solid, but at the same time as flexible as those made of common plaster, and possessed of strength and firmness enough to overcome any obstruction that ought to yield to pressure. They are also of so smooth a surface, that they may be introduced with ease, and so durable, that one case, containing twelve bougies of different sizes, with a little care, will last a surgeon in full practice for many years. The second are hollow, and of sizes similar to the solid ones, finished with a stilet, or wire, of the same metal, for cases where it is judged proper to let them remain in the bladder; but in strictures requiring greater force than can be exerted with these bougies, as they are considerably softer than the silver catheter, a temporary brass or iron wire will give them sufficient strength for their introduction. These bougies, both solid and hollow, will take any degree of curvature that may be thought necessary by the operator previous to their introduction, without being injured thereby; and may be continued in the passage any length of time without danger of breaking or giving the least pain; this he asserts from his own knowledge, having worn one of the larger ones, in some measure for the sake of experiment, eight or nine hours at a time. They cannot be affected by the warmth of the parts to which they are applied, nor acted upon by the stricture, as frequently happens, particularly in the spasmodic contraction of the urethra, nor by the urine, which is always the case when the plaster bougie or elastic gum catheter is used. They may be had of any size, or degree of flexibility; and when tarnished, they may be repolished with a piece of shamoy leather and a little whiting. They are of a conical form, and their action is purely mechanical."

The manner of using these bougies (which indeed applies to the introduction of any other) is thus described:

"Take one of the smaller sizes, and draw it between the finger and thumb to feel whether it be perfectly smooth; if that be the case, then take a little sweet oil and rub it all over, that it may pass the easier. The patient may either stand, or sit in a chair inclining backwards, or lie in bed with his knees drawn up, which latter position is preferable to either. He may then take hold of the penis, near the glans, with one hand, and extend it gently, that the urethra may not be wrinkled, and, with the other, introduce the round end of the bougie, which should be traced with a finger externally, in order to keep it in a right line with the urethra, and it will then meet with no impediment but what is occasioned by the disease. When it meets with any resistance, the patient may turn it round gently with his finger and thumb several times, and as he turns it, press it a little forwards, and continue so to do, until he pass the obstruction, which is all that is necessary. This bougie should remain some time in the passage, and, when withdrawn, another

a little larger may be introduced, continuing the same operation once or twice a day, and gradually increasing the bougie to the size thought proper."

Notwithstanding what is said, however, on this subject, we are not amongst those who give a decided preference to the metallic bougie; which, perhaps, in certain cases, may prove a very useful instrument, particularly in those where the laceration of a stricture is intended by the surgeon.

Bougies, when properly made, can sometimes be kept in for six or eight hours together; but the length of time proper for their retention, must depend much upon the feelings of the patient. At all times when they give much pain they ought to be removed, and not introduced again till the part is in a state fit for receiving them. They should be gradually increased in their size, till the passage returns to its natural dimensions. They ought to be continued for some time after, till it appear that there is no danger of the return of the complaint.

Mr. Hunter very ingeniously employed lunar caustic in the cure of strictures in the urethra. His original method was to pass it down through a metal canula till it came in contact with the diseased part; but as that was found liable to great objections, he afterwards adopted, and since his death, his ingenious relation, Mr. Everard Home, has successfully practised the following improvement:

"Take a bougie, of a size that can be readily passed down to the stricture, and insert a small piece of lunar caustic into the end of it, letting the caustic be even with the surface, but surrounded every where laterally by the substance of the bougie. This should be done some little time before it is required to be used; for the materials of which the bougie is composed become warm and soft by being handled, in inserting the caustic; and therefore the hold the bougie has of the caustic is rendered more secure, after it has been allowed to cool and harden. This bougie, so prepared, is to be oiled and made ready for use; but previous to passing it, a common bougie of the same size is to be introduced down to the stricture to clear the canal, and to measure exactly the distance of the stricture from the external orifice; this distance being marked upon the armed bougie, it is to be passed down to the stricture, immediately upon the other being withdrawn. In its passage, the caustic is scarcely allowed to come in contact with any part of the membrane, the point of the bougie, of which it forms the central part, always moving in the middle line of the canal; and indeed the quickness with which it is conveyed to the stricture prevents any injury to the membrane, where it is accidentally brought to oppose it. In this mode the caustic is passed down with little or no irritation to the lining of the urethra; it is applied in the most advantageous manner to the stricture, and can be retained in that situation the necessary time to produce its effects."

The alleged advantages of this method are, that it produces a permanent cure, which the bougie does not, that the pain consequent on its application is inconsiderable, and that neither irritation nor inflammation are found to supervene. These points, however, will be attended to in the article STRICTURE, already alluded to.

BOUI', a Chinese name for bohea-tea.

BOVI'STA, the *Crepitus lupi*, or PUFF-BALL. It is the *Lycoperdon bovista; subrotundum, lacerato dehiscens.* When dry it contains a powder used by the common people to stop the blood in recent cuts, &c.

BO'ZA, the name of a drink much used in Turkey.

BRABE'JUM, African almond-tree; a genus in Linnæus's botany. There is but one species.

BRA'BYLA, the plums which are called Damascene and Hungarian. They are large, sweet, and of a blue or purple colour.

BRACHIA'LIS ARTERIA, the BRACHIAL ARTERY; a continuation of the axillary artery, which, as it passes behind the tendon of the pectoralis major, receives the name of *brachial.* It runs down on the inside of the arm, over the musculus coraco-brachialis, and anconæus internus, and along the inner edge of the biceps, behind the vena basilica, giving out small branches as it goes along. Below the bend of the arm it divides into the cubitalis and radialis. Sometimes, though rarely, the *brachial artery* is divided from its origin into two large branches, which run down on the arm, and afterwards on the fore-arm, where they are called *cubitalis* and *radialis.*

BRACHIA'LIS MUSCULUS. See BRACHIALIS INTERNUS.

BRACHIA'LIS EXTERNUS. See TRICEPS EXTENSOR CUBITI.

BRACHIA'LIS INTERNUS; the *Brachialis* of Winslow. It is a muscle of the fore-arm, situated on the fore part of the os humeri. It arises fleshy from the middle of the os humeri, at each side of the insertion of the deltoid muscle, covering all the inferior and fore-part of this bone; runs over the joint, and adheres firmly to the ligament. It is inserted, by a strong short tendon, into the coronoid process of the ulna. Its use is to bend the fore-arm, and to prevent the capsular ligament of the joint from being pinched.

BRACHIO-CUBITAL LIGAMENT, or the LIGAMENTUM BRACHIO-CUBITALE. The expansion of the lateral ligament which is fixed in the inner condyle of the os humeri, runs over the capsula, to which it closely adheres, and is inserted like radii on the side of the great figmoid cavity of the ulna. It is covered on the inside by several ten-

dons, which adhere closely to it, and seem to strengthen it in a very considerable degree.

BRACHIO-RADIAL LIGAMENT; that expansion of the lateral ligament, which runs over the external condyle of the os humeri, is inserted round the coronary ligament, from thence all the way down to the neck of the radius, and also in the neighbouring parts of the ulna. Through all this passage it covers the capsular ligament, and is covered by several tendons adhering closely to both.

BRA'CHII OS. See HUMERI os.

BRA'CHIUM, (βραχιων), the arm. In Hippocrates it signifies what is now called the *Humerus*. From the elbow to the wrist is called the fore-arm. By the arm is generally meant the whole from the shoulder to the wrist, but more particularly the *Os Humeri*.

BRACHYPNŒ'A, (βραχυπνοια, from βραχυς, *short*, and πνεω, *to breathe)*, a term used by the ancient writers to denote the breath fetched short, but at long intervals.

BRA'CTEA, (properly a thin leaf or plate of metal), in botany, a floral leaf. It is the name of one of the seven *fulcra* or *props* of plants enumerated by Linnæus, in his *Delineatio Plantæ*, and *Philosophia Botanica*. Dr. Milne says, in his Botanical Dictionary, that the invention of this term, though claimed by Linnæus, is due to Jungius, who uses it for the *corolla* of modern botanists, including under that name both petals and *nectarium*. In fact some of the numerous terms with which that distinguished reformer of botanical language has enriched the science, are found to have been used, either in the same, or in a different sense, by former writers.

Floral leaves differ in size, shape, and colour, from the other leaves of the plant. They are situated on the flower-stalks, and often so near the fructification, as to be confounded with the calyx. For examples of the floral leaf, Dr. Milne refers to the lime tree, *tilia;* cow-wheat, *melampyrum;* sage lavender, *bartsia;* some species of fumatory, *mussaenda*, *hebenstretia*, *monarda*, hellebore, fennel-flower, *nigella;* passion-flower, *passiflora;* wild Syrian rue, *peganum;* bird's-foot, *ornithopus;* some species of French honey-suckle, *hedysarum;* African-broom, *aspalathus;* milk-wort, *polygala;* rest-harrow, *ononis;* lady's-finger, *anthyllis;* kidney-bean, *phaseolus;* base tree-trefoil, *cytisus;* Carolina kidney-bean tree, *glycine;* bird's-foot trefoil, *lotus;* indigo, dragon's-head, *dracocephalum;* and many others might be mentioned.

The bractea is commonly of the same duration with the ordinary leaves of the plant; a circumstance by which, in doubtful cases, it will be distinguished, with great accuracy, from the calyx or flower-cup, which always withers when the fruit is ripe, if not before. We must attend to this observation, as otherwise it would be easy to commit mistakes, in ascertaining several genera of plants; such as hellebore, fennel-flower, passion-flower, and others, which have *bracteæ*, but want the calyx.

With regard to their size and height, floral leaves are shorter than the flower-cup, in snap-tree, *justicia hyssopifolia*, and *ruellia ringens:* longer than the flower-cup, in common clary, *salvia sclarea; ruellia repens*, and *stipa spinifex:* larger than the flower-cup, and placed under it, in *royena villosa:* shorter than the flower, in that species of the spotted clary which bears a sage leaf, *salvia sylvestris; fumaria nobilis*, and *minuartia campestris:* of equal length with the flower, in great bulbous fumatory with a hollow root, *fumaria bulbosa; hypoxis erecta*, and *ornithogalum comosum:* and longer than the flower, in sweet alpine currant, *ribes alpina;* and *minuartia montana*. *Cunila pulegioides*, besides a number of smaller ones, has two floral leaves larger than the flower, placed on each side of the foot-stalk.

With regard to number, plants have either one floral leaf: as viscous field gum-succory, *chondrilla juncea; aristolochia pistolochia*, and *andromeda dabœcia:* two, as *campanula alpina*, *commelina zanonia*, wild briar, *rosa canina; royena, villosa & ringens*, *cineraria sibirica*, and *hypoxis erecta:* three, as *erica calycina*, and distaff-thistle with a bellied netted involucrum, *atractylis cancellata:* four or five as *corymbium scabrum:* or they have several, as in the *cunila pulegioides*, *stipa spinifex*, and many others.

In some plants the *bracteæ*, are composed of two dry scales, and three broader lesser leaves, as in the *lonicera nigra*. In crown-imperial, some species of sage, and a few other plants, the flower-stem is terminated with a number of very large *bracteæ*, which, from their resemblance to a bush of hair, are denominated *coma*, or *bracteæ comosæ*. See COMA.

Floral-leaves, particularly those of the bushy kind just mentioned, afford excellent marks of distinction in determining the species; on which account they merit the careful attention of every botanist.

BRACTEA'TÆ, in botany, the twenty-eighth class in Boerhaave's method of classification. It consists of herbaceous vegetables, which have petals, and whose seeds are furnished with a single *cotyledon*. See COTYLEDON. The term *bractea*, from which the name of this class is manifestly derived, is used by Boerhaave, after Jungius, to denote the *corolla* of the moderns. See BRACTEA. This class of plants stands opposed to the twenty-ninth class, *apetalæ monocotyledones*, of the same author, and is exemplified in the grasses.

BRACTEA'RIA, a genus of talcs, composed of small plates in form of spangles, each plate either being very thin, or fissile into very thin ones. Of this genus there are a great many species, called,

from their different colours, *mica aurea*, or gold glimmer; and *mica argentea*, silver glimmer, or cats-silver, &c.

BRADYPE'PSIA, (βραδυπεψια), a term signifying a weak concoction of the food; or when digestion in the stomach is performed slowly and with difficulty.

BRAGGAT, a drink made of water and honey.

BRAIN. See CEREBRUM.

BRAIN, LITTLE. See CEREBELLUM.

BRAN, the husks or shells of wheat which remain in the boulting machine. It contains a portion of the farinaceous matter, and is found to have an unexpected nutritious quality. See BREAD. Decoctions of bran, sweetened with sugar, are used as a family remedy, and often with success, against coughs, hoarsenesses, &c.

BRA'NCA, (*Branca*, Span. a foot or branch), a term applied to some herbs which are supposed to resemble a particular foot: as the *branca leonis*, lion's foot; *branca ursinæ*, bear's foot, &c.

BRA'NCA LEONI'NA. See ELAPHOBOSCUM.

BRA'NCA URSI'NA, a plant which is directed by this name in foreign pharmacopœias. It is the *Heracleum spondylium; foliolis pinnatifidis, lævibus; floribus uniformibus*, Linn. Great care should be taken to distinguish it from the acanthus, (see ACANTHUS), which is also called *brancha ursina*. In Siberia this vegetable grows extremely tall, and appears to have virtues in the cure of dysentery, which the plants of this country do not possess.

BRANCH, in botany, an arm of a tree, or a part which, sprouting out from the trunk, helps to form the head or crown of it. Branches do not spring out of the mere surface of the trunk, but are altogether of the same composition, so as not only to possess the cortical, but also the woody substance, and even the pith. The constituent parts, therefore, of a branch are the epidermis, bark, wood, and pith. See the article PLANTS.

BRA'NCHÆ, (βραγχοι; from βρεχω, *to make moist)* or BRANCHA; the glands of the fauces, which secrete the saliva for the solution of the aliment.

BRA'NCHUS, (βραγχος, from βρεχω, *to moisten)* a defluxion of humours from the fauces.

BRANDY, *spiritus Gallicus*, or *spiritus vini Gallicus*, a colourless, slightly opake, and milky fluid, of a hot and penetrating taste, and a strong and agreeable smell, when first distilled from the wine. It consists of water, alkohol or ardent spirit, and a small portion of oil, which renders it milky at first, and after a certain time colours it of a reddish yellow; though it is said the distillers produce this artificially. Brandy is the fluid from which rectified or ardent spirit is commonly obtained. The utility of brandy is very considerable, but from its pleasant taste and exhilerating property it is too often taken to excess. It gives a temporary energy to the animal functions; is a powerful tonic, cordial, and antispasmodic; and its utility both in pharmacy and surgery is very great.

BRANKS; the name used in Scotland for the mumps. See CYNANCHE PAROTIDEA.

BRANKURSINE. See ACANTHUS.

BRASILIE'NSE LIGNUM; LOG-WOOD. See HÆMATOXYLUM.

BRASILIE'NSIS, RADIX. By this name the ipecacuanha root is sometimes called. See IPECACUANHA.

BRA'SIUM; malt made from barley.

BRASS, ÆS; a combination of copper with zinc, seldom applied to medical uses.

BRA'SSICA; the systematic name of an important tribe of esculent plants, which anciently, no less than at present, has been in the most frequent use as food. This, though Dr. Cullen has distinguished it by its botanical order, is one of those which have been commonly named *Olera*. The Doctor has marked it as one of the *siliquosæ*, for the sake of observing, in proof of his general doctrine of vegetable aliments being those most free from acrimony, that the brassica is the most free from that peculiar acrimony which distinguishes all the other plants of the class of *Tetradynamia*. It is accordingly the only plant of the class whose leaves are employed as nutriment; and this circumstance of the mildness and sweetness of its juice, with the bulk in which it is produced, will readily show why it has been at all times so much in request as an aliment.

One species of the brassica, designated by the trivial name of *brassica oleracea*, is supposed, by culture and other circumstances, to have been brought to produce many varieties which put on very various appearances, and all of which, for the purposes of the table, are cultivated in most of the countries of Europe. Whether the plants under these different appearances are different species, or varieties of one species only, Dr. Cullen leaves to be determined by botanists; that question not being material in a medical view.

All the varieties of the *brassica oleracea*, he supposes possessed of very similar alimentary qualities. He allows that they may differ in the quantity of nourishment which they severally afford; but this cannot be ascertained with any precision. They are all of them to be considered as a supplemental provision only; and hence are seldom to be chosen by the quantity of nourishment they afford, but rather for their tenderness of texture, and sweetness of flavour.

The *cauliflower* and *broccoli* are the most tender, most easily digested, and least flatulent. Of all those kinds of which the leaves are especially employed, the *brassica sabauda*, or *Savoy cabbage*, appears to be sweeter and more tender than any of

the others. The central and upper leaves gathered pretty closely together, are by much the tenderest portion of the whole plant, and extremely palatable.

Those species of the brassica, whose leaves, after a certain time of their growth, are gathered in greater quantity, and more closely, into a globular head, are named *brassicæ capitatæ*, or *cabbages*. These afford the greatest bulk of product, and perhaps the greatest quantity of nourishment.

The brassicæ in general seem of a pretty firm texture, and they contain, in a very fermentable juice, a great quantity of air, being all noted for producing flatulency in the bowels. As the younger plants are the most tender, so they are the least flatulent; and as the formation of cabbage requires a longer time in growing, so cabbage acquires a firmer texture, and is noted for producing more acescency and flatulency than any other kind. Cabbages are, by their colour, distinguished into two kinds, the *white* and the *red;* and the latter is found to be of the sweeter and tenderer kind.

A new species, the *brassica gongylodes*, is also spoken of by Dr. Cullen, who raised it in his own garden. It is distinguished by its having on the upper part of its stalk a swelled part, or spheroidical tuber, which, within a firm cortical part, is formed of a substance of the same nature with that which forms the medullary part in the stalks of cabbage and other kinds of colewort. This medullary part, when freed from its rind, and very well boiled, is of a tender and sweet substance, and certainly is considerably nourishing, and appears also to be less flatulent than the cabbage. It is firmer in its consistence, and sweeter than the turnip; and, though the hardness of its bark may render it unfit to be reared for the purpose of feeding cattle, Dr. Cullen is of opinion, that, under proper management, it may afford a delicacy for the table.

As the whole of the species contain a great deal of air, Dr. Cullen thinks, they may be rendered fitter for diet by having a great deal of that air extricated before they are employed as food. Our cooks, however, for the sake of the figure it is to make upon the table, seldom give the boiling that is necessary, to the cauliflower and some others, to render them duly digestible. Besides the boiling mentioned, there is another means of extricating the air of cabbage, by subjecting it to a fermentation, as in the preparation of *sauer kraut;* a preparation very generally eaten in Germany. See Sauer kraut.

BRA'SSICA CAPITA'TA; the common cabbage. See Brassica.

BRA'SSICA ERU'CA; the systematic name for the plant which affords the semen erucæ. See Eruca.

BRA'SSICA ERUCA'STRUM. See the article Eruca sylvestris.

BRA'SSICA MARINA, (Κραμβη θαλασσια); *convolvulus maritimus*, or soldanella. This plant, *convolvulus soldanella; foliis reneformibus, pedunculis unifloris* Linn. is a native of the English coasts. The leaves are said to be a drastic purge. They are only used by the common people, the pharmacopœias having now substituted more safe and valuable remedies in their stead.

BRA'SSICA NA'PUS; the systematic name for the plant from which the semen napi is obtained. See Napus.

BRA'SSICA OLERA'CEA; the systematic name for the brassica capitata, or common cabbage. See Brassica.

BRA'SSICA RA'PA; the systematic name for the plant whose root is the well known turnip. See Rapa.

BRAWN, the flesh of a boar, soused or pickled; for which end the animal should be old, because the older he is the thicker will be his skin, and of course the brawn more horny. Dr. Cullen reckons this article of food somewhat more soluble in the stomach than if it had not undergone this preparation; and, when capable of being easily digested, highly nutritious. See Animal food.

BREAD; an important article of food, prepared of flour kneaded with a mixture of yeast, water, and salt, and afterwards baked in an oven. The due preparation of this, and the goodness of the materials used to compose it, are of infinite consequence to health. Mankind seem to have an universal appetite for bread, which may be accounted for on the simple principle, that the preparation of our food depends on the mixture of the animal fluids in every stage. As, among others, the saliva is necessary, it requires dry food as a stimulus to draw it forth; for which reason we use bread with meat, which otherwise would be too quickly swallowed. Bread serves as a medium to blend the oil and water, constituting the food taken into the stomach, which it stimulates; and, if sound and well prepared, it is peculiarly proper for that purpose, being bulky without too much solidity, and firm without difficulty of solution.

Before the invention of mills for grinding corn, bread was prepared by boiling the grain, and forming it into viscous cakes, not very agreeable to the palate, and difficult of digestion. In process of time, machines were constructed for grinding corn, as well as for separating the pure flour; and a method was discovered to raise the dough by fermentation. Dough may be fermented either by leaven or by yeast; but as the latter raises the kneaded mass more uniformly, and produces the sweetest and lightest bread, it is generally and justly preferred. Bread well raised and baked is

not only more agreeable to the taste than unfermented bread, but more readily mixes with water, without forming a viscous mass, or puff, and is at the same time more easily digested in the stomach.

Bread in this country is divided into three kinds, namely, white, wheaten, and household. Fine white bread is made only of flour; the wheaten contains a mixture of the finer part of the bran; and the household nearly the whole substance of the grain. The wholesomeness of this part of our aliment greatly depends on the due application of heat to the whole mass; for, if the baking is not duly performed, it is in vain that the ingredients of which the loaf is composed have been selected with proper care, and the fermentation conducted with adequate skill.

Like all other farinaceous substances, bread is very nourishing, on account of the copious mucilage it contains; but, Dr. Willich observes, if eaten too freely, it is productive of viscidity, which obstructs the intestines, and lays the foundation of habitual costiveness. Leavened bread, or such as has acquired an acidulated taste by a slow fermentation of the dough, is cooling and antiseptic. By this process, all the viscous are combined with the drier parts of the flour, and the fixed air is expelled in baking. New baked bread contains a large proportion of indigestible paste, which may be rendered less unwholesome by allowing it to dry for two or three days, or by toasting it. This mode ought to be adopted, both on account of health and economy, especially in times of scarcity. Stale bread, in every respect, deserves the preference to that which is newly baked; and persons troubled with flatulency, cramp of the stomach, or indigestion, should abstain from new bread, and particularly from hot rolls.

Various substances have been used for bread, instead of wheat. In the years 1629 and 1630, when there was a dearth in this country, bread was made in London by mixing turnips with flour, on the recommendation of Dr. Beale. In 1693 also, when corn was very dear, a great quantity of turnip-bread was made in several parts of the kingdom, but particularly in Essex, by a receipt which is recorded in the Philosophical Transactions. The process is the same with that known to every country housewife, in the mixing of mashed potatoes (the best of all such mixtures) with wheaten flour. It must be allowed, however, that bread prepared by any of these means, but more especially with the roots of esculent vegetables, is less nutritious, and somewhat less likely to agree with the stomach, than bread of unmixed wheaten flour. Dr. Darwin asserts, that if eight pounds of good raw potatoes be grated into cold water, and, after stirring the mixture, the starch be left to subside, and, when collected, it be mixed with eight pounds of boiled potatoes, the mass will make as good bread as that from the best wheaten flour. He likewise observes, that hay, which has been kept in stacks, so as to undergo the saccharine process, may be so managed, by grinding and fermentation with yeast, like bread, as to serve in part for the sustenance of mankind in times of great scarcity. As an instance of the very nutritive quality of hay, it is mentioned, that a cow, after drinking a strong infusion of it, for some time, produced above double the usual quantity of milk. Hence, if bread cannot be made from ground hay, there is reason to believe, that a nutritive beverage may be prepared from it, either in its saccharine state, or by fermenting it into a kind of beer. The same writer attributes to other vegetables the property of affording wholesome nutriment, either by boiling, or drying and grinding them, or by both these processes. Among these, he supposes, may be reckoned, the tops and bark of gooseberry-trees, holly, gorse, and hawthorn. The inner bark of the elm may possibly be converted into a kind of gruel; and the roots of fern, and probably those of many other plants, such as grass or clover, might yield nourishment either by boiling, baking and separating the fibres from the pulp, or by extracting the starch from those which possess an acrid mucilage, such as the white bryony.

The adulteration of flour and bread has often been the subject of animadversion. Mealmen and millers have been accused of adding chalk, lime, &c. to the flour, and bakers of mixing alum with the dough. There is much reason to suspect, that these practices are but too prevalent, and that, generally speaking, they are detrimental to health; yet it must be observed, with regard to the last, that it frequently is found to improve the properties of indifferent flour, which, without this help towards the coagulation of its mucilage, would produce, in many instances, a viscid and unwholesome bread. Dr. Darwin observes, that where much alum is mixed with bread, it may be easily distinguished by the eye: when two loaves so adulterated have stuck together in the oven, they break from each other with a much smoother surface, where they had adhered, than those loaves do which contain no alum.

Dire necessity, a short time back, occasioned many to resort to a mode of preparing bread with *all the bran*, but which was found to disorder the stomach and bowels of those accustomed to bread of the superior kind. An important discovery, however, was made with regard to bran, to wit, that a very large portion of the nutritive matter of the grain resides in it, as indeed might have been known from its property of fattening other animals. If a decoction of the bran only be used in forming the loaf, and the bran itself (which, by the boiling, increases considerably in weight) be *not added* to the dough, the increase of bread will still be consi-

derable; though not more than one-third of the increase obtained, when all the bran is added.

In order to exhibit a distinct view of the most promising substitutes for bread, whether indigenous or exotic, and especially such as have actually been used, on the authority of creditable evidence, Dr. Willich sets down the following list of them, which he divides into three classes.

1. *Farinaceous seeds:*—Wheat-grass, or *triticum spelta;* millet, or *panicum miliaceum;* common buck-wheat, or *polygonum fagopyrum;* wild buck-wheat, or *polygonum convolvulus;* wild fescue-grass, or *festuca fluitans;* maize, or Indian corn, the *mays zea;* rice, or *oryza sativa;* Guinea corn, or white round-seeded Indian millet; the *holcus sorghum*, Linn.: canary-grass, or *phalaris canariensis;* rough dog's-tail grass, or *cynosurus echinatus;* water zizany, or *zizania aquatica;* upright sea lime-grass, or *elymus arenarius;* sea-reed, marram, helme, or sea mat-weed, the *calamus agrostis*, or *arundo arenaria.*

The following mealy fruits, however, deserve a decided preference over many of the preceding: viz. water caltrops, or fruit of the *trapa natans*, Linn.; pulse of various kinds, such as peas, lentils, beans, and the seeds of the common vetch, fetch, or tare-acorns, and especially those of the *quercus cerris* and *esculus;* the seeds of the white goose-foot, common wild orange, or the *chenopodium album;* the seeds and flowers of the rocket, or *brassica eruca*; the seeds of the sorrel, or *rumex acetosa;* of the different species of dock, or *lapathum;* of the yellow and white water-lily, or the *nymphœa lutea* and *alba;* of the corn-spurrey, or *spergula arvensis;* of the spinage, or *spinacia oleracea*, Linn.; of the common gromwell, or gray-mill, the *lithospermum officinale;* of the knot-grass, or *paniculum aviculare;* the beech-nut, the husks of the Lint-seed, &c.

2. *Farinaceous roots:*—namely, those of the common and yellow Bethlem star, or *ornithogalum luteum* and *umbellatum;* of the well known yellow asphodel; of the wake robin, or *arum maculatum* (after being properly dried and washed); of the pilewort, or lesser celandine, the *ranunculus ficaria;* of the common dropwort, the *spirœa filipendula;* of the meadow-sweet, or *spirœa ulmaria;* of the white bryony, or *bryonia alba;* of the turnip-rooted cabbage, or *napobrassica;* of the great bistort, or snake-weed; of the small, Welch, or alpine bistort; of the common orobus, or heath-pea; the tuberous vetch; the common Solomon's seal; the common corn-flag, or *gladiolus communis;* the salt-marsh club-rush, or *scirpus maritimus*, &c. Indeed, some authors also include in this list the roots of the *mandragora*, *colchicum*, *fumaria bulb.; helleborus aconitifolius*, and *niger*, *lilium bulbiferum*, and many others; but for these last mentioned we have not sufficient authority.

3. *Fibrous and less juicy roots:*—viz. those of the couch-grass, or creeping wheat grass; the clown's, or marsh wound-wort; the marsh mary-gold, or meadow bouts; the silver-weed, or wild tansey; the sea seg, or *carex arenarius*, &c.

BREASTS, the two globular projections, composed of common integuments, adipose substance, and lacteal glands and vessels, and adhering to the anterior and lateral regions of the thorax in adults of the female sex. See MAMMÆ.

BRE'GMA; an old name for the parietal bones. See CRANIUM.

BRENTWOOD WATER, a mineral spring of the alcaline kind, but, not so powerful as that at Tilbury.

BRE'VIA VA'SA. The vena splenica, towards its termination, is divided into several branches that go to the spleen, one of which produces the veins that receive this name.

BRE'VIS, a name given to the *teres minor.*

BRE'VIS CU'BITI, is a muscle that rises from the superior and posterior part of the humerus; which, joining its fleshy fibres with the brachiæus, externus, and longus, and becoming tendinous, covers the elbow, and, is inserted into the olecranon to extend the arm.

BRE'VIS RA'DII, a muscle that comes from the external and upper part of the ulna, and, passing round the radius, is inserted into its upper and fore part, below the tendon of the biceps. This and the longus radii, are called the *supinatores*, their office being to turn the palm upwards.

BRE'VIS PALMA'RIS, lies under the aponeurosis of the palmaris; and, arises from the bone of the metacarpus, that sustains the little finger, and, from that bone of the carpus that lies above the wrist. It passes transversely, and is inserted into the eighth bone of the carpus. It assists in making the palm of the hand concave.

BRE'YNIA, a species of CAPPARIS.

BRE'YNIA, in botany, a synonime of the CAPPARIS. See CAPPARIS.

BRIAR, WILD. See CYNOSBATUS.

BRICU'MUM, a name which the Gauls gave to the herb ARTEMISIA.

BRI'GNOLA, a variety of the *prunus domestica.*

BRIMSTONE. See SULPHUR.

BRIMSTONE FLOWERS. See FLORES SULPHURIS.

BRI'NDONES, a red fruit the produce of a tree growing in the East Indies. It is kept for making vinegar from, and, is also a material used in colouring.

BRINE, a pickle, pregnant with salt and other ingredients, usually employed in preserving meat, fish, &c. from putrefaction. Brine is employed by some practitioners as a bath for œdematous swellings of the legs in dropsy. It has the property of giving tone to the vessels of the skin, and may prevent its

cracking from over distension; but its effect is merely topical.

BRIONY, or Bryony. See Bryonia.

BRISTOL HOTWELL, a mineral spring situated at the bottom of St. Vincent's Rock, on the Gloucestershire bank of the river Avon, about a mile below Bristol, and within four miles of the British Channel, or arm of the sea. The rock, from which the hot spring issues, is a hard, compact, and very fine lime-stone, interspersed with calcareous spar, and containing those transparent quartz crystals, formerly much esteemed, and known by the name of Bristol stones.

The Hotwell spring is a clear tepid water, which rises to the quantity of forty gallons in a minute. When fresh, it is inodorous, and sends forth numerous air bubbles if poured into a glass. It is agreeable to the palate, but without any particular taste. Its specific gravity is 1.00077; from which it is evident, that it contains but a very small intermixture of foreign substances. It is of a very moderate warmth, and the difference of temperature, as given by several observers, may be partly owing to a slight variation in the heat of the spring itself, and partly to a difference in the thermometers. Dr. Carrick calculates its real temperature, as it is drunk at the pump, at $74\frac{1}{2}°$; and Dr. Nott states its highest point at 76°; though we have, with a very accurate thermometer, in April, 1798, found it to be only 72°. According to Dr. Carrick's analysis, a gallon of 231 cubic inches contains thirty inches of carbonic acid, and three inches of common air. By a farther analysis of Bristol water, by evaporation to dryness, he obtained the following contents in the wine gallon: of muriated magnesia, $7\frac{3}{4}$ grains; muriated soda, 4; sulphated soda, $11\frac{1}{4}$; selenite, $11\frac{1}{4}$; and carbonated lime, $13\frac{1}{2}$; making $47\frac{3}{4}$ grains of solid contents. Dr. Nott, from one gallon of the water, obtained a residuum by evaporation, which weighed fifty-two grains. On examination, he found it to contain, in various combinations, vitriolic acid, aërial (carbonic) acid, a peculiar gas, holding calx in most intimate solution, marine salt in a large proportion, and calcareous earth.

From these investigations of the Hotwell water it is evident, that the principal component parts are, a large proportion of carbonic acid gas, or fixed air; and a certain portion of magnesia, and lime in various combinations with the muriatic, vitriolic, and carbonic acids. The general inference is, that it is considerably pure for a natural fountain, as it contains no other solid matter than is found in almost all common spring water, and in less quantity.

On account of these ingredients, especially the carbonic acid gas, the Hotwell water is efficacious in promoting salutary hæmorrhages in green sickness, as well as in the blind hemorrhoids. It may be taken with advantage in obstructions and weakness of the bowels, arising from habitual costiveness. It is one of the safest and most efficacious remedies, Dr. Willich says, in sweetening the acrimony of the vitiated humours of debilitated and consumptive patients, as it is supposed to pervade the most minute capillary vessels, and is well known to have a salutary effect on the first passages. Hence it has, for upwards of a century, been justly considered as a specific in diabetes; but if, in this disease, as well as in hectic fevers in general, the water should disagree with the stomach, as is frequently the case with persons who have impaired that organ by intemperance, or if there be room for the least apprehension of plethora, or a determination of the blood towards the breast and head, the use of it should not be attempted, without proper advice.

But the high reputation which this fountain has acquired, is chiefly in the cure of pulmonary consumption. From the number of unsuccessful cases, however, among those who have used the Bristol water in this disease, many have denied any peculiar efficacy in this spring, superior to that of common water. Experience has proved that it alleviates some of the most distressing symptoms of this formidable disease; and it is particularly efficacious in moderating the thirst, dry burning heat of the hands and feet, partial night-sweats, and hectical symptoms. Hence, in the earlier stages of phthisis, this water may materially contribute to the restoration of health, and even in the latter periods, mitigate the disease, when the cure is doubtful, if not hopeless.

The sensible effects of this water, when drank warm and fresh from the spring, are, a gentle glow of the stomach, succeeded sometimes by a slight and transient degree of headach and giddiness. By a continued use, in most cases, it is diuretic, keeps the skin moist, and perspirable, and improves the appetite and health. Its effects on the bowels are variable. On the whole, a tendency to costiveness seems to be the more general consequence of a long course of this medicinal spring, and therefore the use of a mild aperient is requisite. These effects, however, are applicable only to invalids, for healthy persons, who taste the water at the fountain, seldom discover any thing in it but a degree of warmth, which distinguishes it from the common element.

The season for the Hotwell is generally from the middle of May to October; but as the medicinal propertie of the water continue the same throughout the year, the summer months are preferred merely on account of the concomitant benefits of air and exercise. A gentle laxative is the only necessary preparative, previous to the use of the water, especially after a journey, by which the body is generally disposed to costiveness. Two or

three days rest ought to be taken after great fatigue, before this water can be used with advantage. Early in the morning, and two hours before breakfast, is the most proper time for employing this water medicinally, when it is usual to take two glasses, spending about half an hour in gentle exercise between each dose. Two glasses are afterwards taken between breakfast and dinner; and these are generally found to be sufficient in one day. The size of the glass varies from a quarter to half a pint: the latter is reckoned a full dose.

Hectical patients, however, should begin their dietetic course with a glass of ass's milk, and gradually increase the quantity from half a pint to a pint. Those with whom the water disagrees, when taken fasting, should begin with a quarter of a pint at a time, and take from four to six doses in the course of the day; one dose about an hour before, and another an hour after a meal. If it operate as a cathartic, which is not uncommon in relaxed habits, a small dose of ipecacuanha, or if it occasion costiveness, a quantity of rhubarb and cream of tartar, will be necessary to assist its operation. In every case, it is best to drink it at the fountain-head, as its volatile particles easily escape. The exercise of walking, or riding on horseback, immediately after taking the water, can be recommended to the robust only; for the infirm require more gentle exercise, such as riding in a carriage, sailing in a boat, and the like. Persons of a very irritable habit should sit down for a quarter of an hour, after having taken a draught of the water, which may be increased from a quarter of a pint to a pint, according to circumstances.

The Hotwell, though considerably higher than the river Avon, is, however, so far affected by the spring tides, which rise in that river, that it becomes, in some degree, turbid. It is then not thought to be so efficacious; but, after two hours pumping, the spring generally returns to its original purity.

BRITA'NNICA HE'RBA. See Hydrolapathum.

BRITISH OIL; a variety of the black species of petroleum, to which this name has been given as an empirical remedy, It is found floating on springs, having oozed out of the stone which produces it. It is generally found with us, in a stone of a black colour, and of a granulated structure, which yields it on distillation.

BRITTLENESS, that quality of bodies which subjects them to be easily and completely broken by pressure or percussion. Brittle bodies are extremely hard; a very small percussion exerts a force on them equivalent to the greatest pressure, and thus may easily break them. This effect is particularly remarkable in glass suddenly cooled, the brittleness of which is thereby much increased. Tin, though in itself tough, gives a brittleness to all the other metals when mixed with them.

The bones are liable to two opposite diseases; the one termed *friabilitas*, the other *mollities*, or softness: the former peculiar to adults, the latter more frequent in infants, though sometimes seen in adults, from a vitiated state of their fibres. The bones, when deprived of their cementing principle, from any cause, become friable. From repeated salivations, and in old people, they have been rendered extremely brittle; insomuch that, in many subjects, they have been fractured merely from the weight of the body and the action of the muscles: but, in such cases, this is not owing to the friability of the bones, but to the loss of substance, from the erosion of the bone by an acrimonious process taking place in it; to which cause perhaps may be attributed the disease called *rickets* in children.

BRI'ZA; quake-grass; a genus in Linnæus's botany. He enumerates five species.

BRO'CCOLI; the *brassica Italica.* See Brassica. As an article of diet, this may be considered as more delicious than cauliflower and cabbage. Sound stomachs digest broccoli without any inconvenience; but, in dyspeptic affections of the stomach, even when combined with pepper, &c. it often produces flatulency and eructations.

BRO'CHUS, (βροχος); a name by which the old writers distinguished a person with a prominent under lip, or one with a full mouth and prominent teeth.

BRO'DIUM; a term in ancient pharmacy, signifying the same with jusculum, i. e. broth, or the liquor in which any thing is boiled. Thus we sometimes read of brodium salis, or a decoction of salt.

BROMATOLO'GIA, (from βρωμα, *food*, and λογος, *a discourse*); bromatology, or a discourse or treatise on food.

BROME'LIA ANA'NAS; the systematic name of the plant which affords the ananas. See Ananas.

BROME'LIA KARA'TAS; the systematic name of the plant from which we obtain the fruit called penguin. This fruit is given, in the Spanish West Indies, to cool the blood and quench thirst, in fevers, dysenteries, &c. It grows in a cluster, there being several of the size of one's finger together. Each portion is clothed with a husk, containing a white pulpy substance, which is the eatable part; and, if it be not perfectly ripe, its flavour somewhat resembles that of the pine-apple. The juice of the ripe fruit is very austere, and is made use of to acidulate punch. The inhabitants of the West Indies make a wine of the penguin, which is very intoxicating, and has a good flavour.

BROMEGRASS. See Bromus.

BRO'MUS, (βρομος, or βρωμος), bromegrass; a genus in Linnæus's botany. He enumerates twenty-five species.

BRO'MUS NERI'LIS; DRANK, or wild oats.

BRO'NCHIA, (βρογχια, βρογχος, the *throat*). The trachea descends from the fauces down the throat, preserving its figure as it approaches to the lungs, and, a little before it reaches to them, it divides into two branches, called the bronchia. These ramifications are divided into numberless others, which are distributed through the substance of the lungs; and terminate in small cells or vesicles, like clusters, which adhere to these small bronchial ramifications, constituting the chief part of the lungs. The use of the bronchia is for the conveyance of air into, and out from, the lungs, and for the discharge of such other matter as is secreted by the mucous membrane.

BRONCHIA'LES GLANDULÆ. At the angle of the first ramification of the trachea, we find, on both the fore and back sides, certain soft, roundish, glandular bodies, of a bluish or blackish colour, and of a texture partly like that of the thymus, and partly like that of the thyroid glands. There are many smaller glands at the origin of each ramification of the bronchia.

BRONCHIA'LIS ARTERIA; a branch of the *aorta* given off from the chest. The bronchial arteries sometimes go from the fore side of the superior descending aorta, sometimes from the first intercostal, and sometimes from the arteries of the œsophagus. Sometimes they arise separately from each side, to go to each lobe of the lungs, and sometimes by a small common trunk, which afterwards separates towards the right and left hand, at the bifurcation of the trachea, and accompanies the ramifications of the bronchia. The bronchial artery on the left side often comes from the aorta, while the other arises from the superior intercostal on the same side; which variety is owing to the situation of the aorta.

BRONCHIA'LIS GLANDULA, i. e. THYROIDÆA GLANDULA.

BRONCHOCE'LE, (βρογχοκηλη, from βρογχος, the *wind-pipe*, and κηλη, a *tumor*;) a swelling on the fore-part of the neck, seated between the trachea and the skin, termed in French *goitre*. In this country it is not rare; but more frequent among the inhabitants of the Alps, and other mountainous countries, and is supposed to be owing to the use of snow-water. It is seated most frequently in the thyroid gland; though, in two cases examined by Mr. Benjamin Bell, this gland was diminished from the compression of the tumor, which was chiefly formed of condensed cellular substance, with effusions in different parts of it of a viscid brown matter. Mr. Prosser considers bronchocele as a dropsical affection of the thyroid gland; and, in confirmation of this, he gives an account of a dissection of a diseased gland of this kind by Dr. Hunter, who found in it a great number of capsules filled with water. The swelling is at first soft, without pain or any evident fluctuation, and the skin retains its natural appearance; but, as the tumor advances in size, it becomes unequally hard; the skin acquires a copper colour, and the veins of the neck become varicose; the face becomes flushed, and the patient complains of frequent headachs, as well as of stinging pains through the body of the tumor.

Frequent frictions are found useful, especially when employed early; saponaceous and mercurial plasters, too, have in some cases proved serviceable; and repeated blisters have been known to retard its progress. In the enlarged and scirrhous state of the tumor, no remedy yet known is powerful enough to discuss it. When the disease is far advanced, the removal of the tumor by an operation must be attended with great danger, on account of the enlarged state of the arteries, as well as its vicinity to the common carotids. It is therefore thought by some of the most experienced practitioners, that the cure should rather be attempted by internal remedies; and, in fact, these are very often found to succeed when the disease has not been of too long standing. The following formula appears in the Pharmacopœia Chirurgica:

℞ Spongiæ ustæ drach. ſs.
Mucilaginis arabici gummi q. ſ.
Fiat trochiscus.

In the cure of the bronchocele, the internal use of burnt sponge, has, for some time, been considered as a most efficient remedy. It has been joined, by different practitioners, with many other ingredients, and administered in a variety of shapes. Dr. Cheston, of Gloucester, has found it to succeed in a great number of cases, when employed agreeably to the above formula, and subject to the following regulations, which certainly appear to be an improvement on the methods recommended in the Coventry receipt, which we shall presently insert.

When the tumor appears about the age of puberty, and before its structure has been too morbidly deranged, a pill, consisting of a grain or two of calomel, must be given for three successive nights, and, on the fourth morning, a saline purge. Every night afterwards, for three weeks, one of the troches should, when the patient is in bed, be put under the tongue, suffered to dissolve gradually, and the solution swallowed. The disgust at first arising from this remedy, soon wears off. The pills and purge are to be repeated at the end of three weeks, and the troches had recourse to as before; and this plan is to be pursued till the tumor is entirely got the better of.

The receipt given by Mr. Wilmer, as the means used by Dr. Bate, of Coventry, for the cure of his daughter, and which afterwards grew into so great celebrity, is much more elaborate. A bolus, including ten grains of calcined sponge, and the

like quantity of calcined cork and burnt pumice stone, was ordered to be administered thus:

"The day after the moon hath been at the full, the patient is to take a vomit, and, on the succeeding day, a purge. On the third night, going to bed, the above bolus is to be placed under the tongue, and, being allowed to dissolve gradually, is to be swallowed. This is to be repeated for seven nights; and, in the forenoon of each day, a powder is to be given, consisting of flowers of chamomile, gentian root, and seeds of the lesser centaury, each in powder, five grains. On the eighth day, the purge is to be repeated; and, in the wane of the succeeding moon, the same process is to be commenced, and repeated a third time, unless the disease is cured before. The vomit is only to precede the first course of medicine."

In another recipe, the bolus consisted simply of the calcined sponge, in the dose directed in the troche first mentioned; but the directions with regard to the bitter powders, &c. were the same in every respect.

The bronchocele has, most undoubtedly, been cured in a number of instances by the exhibition of burnt sponge. In common with other scrofulous affections, it is not difficult to suppose, that the stimulus given to the intestines by an occasional dose of calomel as a purge, is of service; but it is a question, whether the periodical discipline held forth in the Coventry remedy, is not of too empirical a description; and whether the weak habits in which scrofula usually exists, may not be injured by so free a use of evacuants.

Mr. Prosser, in his account and method of cure of the bronchocele, published in 1771, recommends the following remedy:

℞ Hydrarg. sulphur. rub. ℈j
Milleped. in pulv. trit.
Spong. ust. sing. gr. xv. Misce.

This powder he directs to be taken an hour or two before breakfast, for a fortnight or three weeks. The patient is then to abstain from medicine for a fortnight, at the end of which she is to have recourse to the powders as before, and also to take the mercurial pill of the old London Dispensatory, from five to ten grains at a dose, according to the age and strength of the patient, and according to its immediate effects on the bowels.

By the use of these remedies, he states, that the tumor generally disappeared in a month or six weeks; especially if the patient was young, and the disease recent. The millepedes in the powder, however, may no doubt be omitted, not only as being inert, but adding considerably to the bulk of the medicine.

Mr. Ring, a practitioner in London, says, he has many times known external stimulants, and mercurials, tried in vain; and sometimes the *spongia usta* itself given inwardly in other forms to no purpose; yet in the following manner it has succeeded:

℞ Spong. ust. ℥ij.
Pulv. gum. arab. ʒij.
Pulv. cinnam. ʒſs.
Syr. simpl. q. s. ut fiant trochisci xxiv.
Sumat j. bis terve indies.

Care must be taken that no more syrup be used than is absolutely necessary to make the dry ingredients properly cohere; for which reason it must be added slowly, and the mass must be beaten well. The lozenges are to be dried before the fire, on a plate that has been slightly oiled, to prevent them from sticking; and must be kept in a bottle, or in a gallipot, tied over with leather.

Mr. Ring cites an instance, where one was taken twice a-day, for a great length of time, to no purpose; but, when the number of doses was increased to three, the good effect was soon evident.

BRO'NCHOS. (βρογχος), a suppression of the voice from catarrh. When a catarrh chiefly affects the fauces, some writers have called it by this name.

BRONCHO'TOMY, (from βρογχος, *the windpipe*, and τεμνω, *to cut*), also called TRACHEOTOMY; an operation by which an incision is made into the trachea, to procure a passage for air into the lungs, when respiration is obstructed to such a degree that life is in danger. If the patient's breathing be already stopped, the operation ought to be done with the greatest expedition; using any instrument which will most readily make an opening in the trachea, as the delay of a few moments will often put a period to the person's existence. Experience has shown, indeed, that in much the greater number of cases, by a total stoppage of respiration for only five or six minutes, life is irrecoverably destroyed.

In performing this operation, where, from the nature of the case, sufficient time is allowed, the patient is to be laid on his back upon a table, and properly secured by assistants. A longitudinal incision is to be made, about an inch and a half long, through the skin and cellular substance, beginning at the under-edge of the thyroid cartilage; the sterno-hyoid and thyroid muscles are then to be separated; the thyroid gland is to be avoided as much as possible, on account of its vascularity. As soon as the trachea is laid bare, the bleeding vessels, to prevent coughing, are to be secured; then, with a common lancet, a puncture is to be made as high as may seem practicable between two rings of the trachea, of such a size as to admit the introduction of a double canula, (represented in pl. vi.) large enough to allow the patient to breathe freely, and

of such a length as neither to be in danger of slipping out, nor of irritating the back part of the trachea. Such a canula has long been recommended by Doctor Monro in his course of surgery. Previous to the introduction the canula may be put through several folds of linen compress, or these may be first slit half way down and applied, so that any of them may be removed and replaced at pleasure. This double canula is to be fixed by a strap round the neck: and when mucus obstructs the passage of the instrument, the inner tube can be withdrawn, cleared, and readily replaced; while the patient is, during this time, breathing through the outer one, and by means of a screw the tubes can be regulated according to the motions of the trachea. After the canula is fixed, it ought to be covered with a piece of gauze or crape, to prevent the admission of dust, insects, &c. As soon as the causes inducing suffocation are removed, the canula is to be withdrawn, and the skin immediately brought over the orifice, and retained there by a slip of adhesive plaster.

BRO'NTES. See BELEMNITES.

BRONTOLOGY, (from βροντε, *thunder*, and λωγος, *a discourse)*, the doctrine which explains the phenomena of thunder, and its physical effects on animate and inanimate bodies.

BROOKLIME SPEEDWELL. See BECCABUNGA.

BROOM, COMMON, the English name of the *Spartium scoparium* Linn. See GENISTA.

BROOM-GALL, a name given by authors to a remarkable species of galls found on the *genista vulgaris*, or common broom. This is occasioned, like all other galls, by the puncture and fretting of an insect; and, when opened, is found to contain a small oblong worm, of a red colour, but whose size requires the use of a glass in order to see it distinctly.

BRO'SSÆA, a genus in Linnæus's botany. There is but one species.

BROWA'LLIA, a genus in Linnæus's botany. He enumerates three species.

BRO'WNEA, a genus in Linnæus's botany. There is but one species.

BRU'CEA ANTIDYSENTE'RICA; the systematic name of the plant from which it is supposed we obtain the angustura bark. See ANGUSTURÆ CORTEX.

BRU'CEA FERRUGI'NEA; another species of brucea, which is also supposed to afford the angustura bark. See ANGUSTURÆ CORTEX.

BRUISE. See CONTUSION.

BRUISEWORT. See SAPONARIA.

BRUMA'LES, (from *bruma*, winter), an epithet applied to plants which flower in our winter. These are common about the Cape, as we learn from Linnæus, *Phil. Bot.* p. 276.

BRUNE'LLA, common self-heal. It is the *prunella vulgaris* of Linnæus. See PRUNELLA.

BRU'NIA, a genus in Linnæus's botany. He enumerates eight species.

BRUNI'ADES, a species of *erica*, and a species of *protea*.

BRUNNER'S GLANDS, otherwise called *Peyer's glands*. They are the muciparous glands, which are situated between the villous and cellular coats of the intestinal canal; so named after Brunner, who discovered them.

BRUNONIANISM, or BRUNONIAN SYSTEM, a system of medicine which has been so named from its promulgator, the late Dr. John Brown, of Edinburgh. At a time when some of the Universities in Europe and America, and many physicians both at home and abroad, are directing their attention, by encomiums or criticisms, to this *system;* when it has even begun to be adopted in practice and openly avowed by its admirers in this kingdom; a concise view of its principles and peculiarites become indispensible to the medical student. Though dignified by its admirers with the title of a system, it will be obvious, after due examination, that there are many chasms in it, in common with all other medical systems; and many errors, the correction of which will require much time and observation, even if the fundamental principles of it be unexceptionable, which, however, we are by no means disposed to allow.

The circumstances attending the first promulgation of Dr. Brown's opinions, in Edinburgh, induced the professors and established practitioners to unite very generally in opposing them. They indeed perceived, that the application of his system to practice, was by no means so simple and obvious, as the young students, who first embraced it, imagined; and therefore they, in all probability, opposed it from an opinion of its dangerous tendency, no less than from a disapprobation of the conduct of its author. It so happened, however, that this opposition, in a University, which, since the death of Boerhaave, has dictated the medical opinions of Europe and America, contributed most effectually to disseminate and establish the new doctrines. The Medical Societies, instituted there for the discussion of subjects connected with medicine, have an almost irresistible influence over the opinions of members, which consist almost entirely of young students, and the presidents are always elected from among themselves; so that their debates are never over-awed by the presence of professors or established practitioners. The Society, called the Royal Medical Society of Edinburgh, were in the habit of discussing medical subjects, on the principles of the spasmodic, or *Cullenian*, theory, which they had acquired from the works of Hoffman, long before the professors them-

selves had relinquished the opinions of the Boerhaavian school. It is also true, that during the latter part of the life of Dr. Cullen, the Brunonian system was adopted in all these societies, though the graduates of the University were not allowed to publish their theses upon any other principles than those taught by the professors. The system of Brown, adopted and disseminated by at least 200 young men annually, from which number the surgeons and physicians of the navy and army are generally supplied, as well as the practitioners of the East and West Indies, must necessarily, in a very few years, affect the opinions of the whole medical world. This was really the case; but persons established in the profession were somewhat backward in declaring their opinions, till the eccentric though celebrated Dr. Darwin openly professed himself to have been a Brunonian, even before he had heard of Brown's system.

The learned were ashamed to avow the opinions of Paracelsus, before Van Helmont openly adopted them. This reluctance in the human mind, against being led by an individual, or being the first to join an innovator, appears to arise from the unwillingness of admitting a dictator, or from the ridicule commonly thrown upon an early apostate from established opinions. Since the publication of Zoonomia, (see Fever), the language and sentiments of Brunonianism are become common; but what is remarkable, though by no means singular, on the occasion, is, that a majority of the persons who are become converts to the doctrine, are totally unable to recollect, when or how they were converted. But it is our business to give an account of the system, rather than of the means which retarded or promoted its promulgation.

The common opinion respecting life, or the vital principle in animals and vegetables, is, that it is entirely distinct from the organization of the body in which it resides; that it is a separate, independent principle, added to the body in some early period of its existence, and which there continues unchangeable, and then leaves it at a late period, when it finds the habitation no longer tenable. Dr. Brown, on the contrary, considers life as an assemblage of actions or effects, which take place in the body, in consequence of a certain predisposition and exciting causes; and that the state or quantum of the vital principle, or energy of the system, is *perpetually varying*. Thus the abstraction of heat and food may reduce the powers of life so low, that the hot bath, or a glass of wine, would be sufficient to destroy the patient. On the other hand, a jail fever, in a few days, may so far diminish the vital energy, that a warm room, and a bottle of wine a day, may become necessary to preserve life. In the former case, the predisposition is said to be morbidly accumulated; in the latter, exhausted. This short statement includes the basis of the system; but, before we proceed to develope it further, it is necessary to explain a few terms, which are peculiar to the doctrine, or employed in a peculiar sense.

The degree or state of action, or vigour of the system, or energy of the vital principle, which is present at any time, is here called

Excitement.—It has been suggested, that Dr. Brown adopted this term, because Dr. Cullen had rendered it fashionable and familiar to the profession, though he used it in a more limited acceptation. We rather suppose it was preferred on account of its implying here no particular hypothesis.

That state of the organization of the solids and fluids, which constitutes the predisposition to *excitement*, is denoted by the term

Excitability.—Some of Dr. Brown's followers, who were of opinion that the *excitability* of the system depended upon the state of the muscular fibre alone, employed the word *irritability*, as synonymous with *excitability*. But this is objectionable, as being founded on an opinion not generally received.

All those powers, both internal and external, such as the passions, heat, food, medicines, contagion, pain, &c. which, by acting upon the excitability, produce *excitement*, are included under the general name of

Stimuli.—This term is perhaps more objectionable than either of the preceding, on account of the enormous extension of its application. Stimulants and sedatives were terms that had long been received as antagonists in a medical sense. The annihilating one, and making it only a degree of the other, was a shock to medical language too great to be aquiesced in on a sudden. Yet we know, that in the language of the profession, heat and cold were formerly considered as antagonists, but now nobody doubts that they are only different degrees of heat. The same error pervades medical language, when speaking of the exciting passions; the effects of hope are often imputed to fear, which is only a different degree of hope. If, for the sake of avoiding the term *stimuli*, Dr. Brown had used *exciting powers*, the absurdity of exciting powers producing depression, in however low a degree applied, would have appeared more objectionable than the generalization of the term. We shall soon see, that the different *degrees* or *intensities* of stimuli, may often be substituted for most of the different genera and species of them, as well as those supposed *antagonists*.

Having explained the chief radical terms peculiar to this system, we shall next proceed to its developement with respect to the operation of stimuli upon the excitability, in producing the various de-

grees of excitement, upon which all health and disease are said to depend.

1. The *excitability* of the whole body, as well as of particular parts, is by Dr. Brown supposed to be in a state of *perpetual variation.* This variation depends upon the time and manner of application, of the internal and external stimuli employed.

To illustrate this fundamental position, we may instance the change which takes place in the progress of life, independent of accidental circumstances. In the first days after birth, excitability of the primæ viæ is such, that a few grains of manna will act as an operative dose. During the first year, the healthy excitement of the system may be supported by a milk diet; and it argues an abuse of stimuli, if a glass of wine does not prove an excessive stimulus before the age of puberty. In advanced life, it is well known, that the stimuli just mentioned, are far too feeble to produce anyobvious effect or excitement. If these ideas were not founded in truth, there is no obvious reason why animals and vegetables might not be immortal.

The accidental circumstances, which we have just alluded to, as most commonly producing variations in the excitability, are, the internal and external stimuli above mentioned. The changes, however, depend almost entirely upon the manner of applying them. It is not the rare or casual operation of stimuli, which produces any permanently important variation in the excitability; but that which, frequently and regularly repeated, changes custom into habit. This may be illustrated by referring to the effects of opium, tobacco, spirits, &c. upon persons accustomed to the use of them. We may also advert to the various states of excitability at the commencement and during the progress of fevers; in persons properly fed and cloathed; and in the same persons, when accidentally deprived of these comforts, &c. &c.

2. The degrees, intensity, or sum of stimuli, which act upon the excitability, and regulate the excitement or energy of the system, ought to be considered in respect both of force and permanency. But, before we can speak of the force or intensity of the existing stimuli at any time, it will be necessary to obviate the inconsistency above alluded to, in calling those things stimuli, or exciting powers, which produce sedative or debilitating effects. If it were possible to exhibit any substance entirely void of heat; or to conceive a total absence of internal stimuli during life; and if we had terms to denote these circumstances, in various degrees of intensity, which is obviously absurd, and impossible, then might we employ the terms "*power of cold*," "*directly debilitating powers*," &c. without outraging the common acceptation of terms. The author of this system has been accused of a want of precision in this respect.

No person can doubt, that an abstraction of the cheerful passions, of heat, or of necessary food, may directly and immediately produce debility. This is the debility arising from deficient stimuli, and called by Dr. Brown *direct debility.* But as this state of the system is found to be more susceptible of the operation of stimuli than the healthy state, it is inferred that the *excitability is accumulated;* so that *direct debility* and *accumulated excitability*, are employed as equivalent terms.

When the energy of the system has been diminished, or debility produced, in consequence of the inordinate application of stimuli, as of joy, heat, voluntary motion, wine, opium, &c. this debility, as being *consequent* to unusual *excitement*, is called *indirect debilty*, or *exhausted excitability.*

According to this system, health, and continued vigorous action of the body, depend upon a due balance or proportion between the stimuli and excitability, so that the latter may neither accumulate nor be exhausted for many hours together. It therefore follows, that all disease arises from a morbid accumulation or exhaustion of the excitability, or from direct or indirect debility. And as two different degrees of excitement cannot possibly exist in the same person simultaneously, it is impossible that two different constitutional diseases should be present at the same time.

From this short sketch of the causes of health and disease, according to this system, it will be obvious, that the preservation of the former, or the cure of the latter, must principally depend on the due application of stimuli.

If time and experience had reduced this to fixed rules, nothing would be wanted to the completion of the Brunonian doctrine. In order to explain this part of the subject, we shall adduce a few instances.

If a person who had been confined for several years in a cold and dark dungeon, and fed on bread and water, were committed to our care, or cure, for the state of his system could not be that of health, though no specific disease may be actually present; we should not expose his eyes to the glare of the sun, his body to the hot bath, his limbs to fatigue, or his stomach to fermented liquors. In the practice to be adopted, all are agreed; but the Brunonian explains it in this manner:—The excitability being accumulated in so inordinate a degree, the stimuli to be adopted must not exceed those usually applied to a new born child, otherwise a fatal inflammation, or sudden death, would ensue. But if the stimuli of light, motion, and food, be applied at first in very low degrees, the excitability may be gradually brought down to the common standard; and of course become capable of bearing the stimuli usually applied to healthy persons.

If, on the contrary, we found a patient who had

been affected for several days with jail fever, and reduced to as great a degree of debility as could be compatible wi h life, the whole profession would agree in the mode of treatment; that is, in applying warmth, or blisters, externally, and in giving brandy, wine, spices, opium, æther, bark, &c. in appropriate doses, internally. The Brunonian justifies and explains his practice, by stating, that the excitability is so rapidly and inordinately exhausted in these fevers, that an excitement compatible with the continuance of life, and restoration of health, can alone be produced and supported by the most powerful and diffusible stimuli.

We perceive, then, that the cure of all diseases, according to this system, consists in proportioning the stimuli to the degree of excitability present in the patient, till healthy excitement is restored.— As a general rule, we are advised to apply the stimuli in the inverse ratio of the excitability, in order to produce the most salutary action, or excitement of the system. Dr. Brown, and his adherents, explain this in the following manner. They suppose any state of the excitability, compatible with the continuance of life in the extremes, or with health in the midle of the scale, may be represented by the common numbers, from 1 to 19; and that the different degrees of stimuli which may be applied to it, to restore or preserve health, may also be represented by the same numbers in the inverted order. Thus,

	Excitability, or Predisposition.	Sum of Stimuli.	Product, or Excitement.			
Accumulation.	20	0	0	death	A	Direct debility.
	19	1	19	——	B	
	18	2	36	——	C	
	17	3	51	——	D	
	16	4	64	——	E	
	15	5	75	——	F	
	14	6	84	——	G	
Health.	13	7	91	——	H	Limits of health.
	12	8	96	——	I	
	11	9	99	——	K	
	10	10	100	——	L	
	9	11	99	——	M	
	8	12	96	——	N	
	7	13	91	——	O	
Exhaustion.	6	14	84	——	P	Indirect debility.
	5	15	75	——	Q	
	4	16	64	——	R	
	3	17	51	——	S	
	2	18	36	——	T	
	1	19	19	——	U	
	0	20	0	death	V	

From (A) to (G) includes those diseases which arise from the abstraction of necessary stimuli, as scurvy, petechiæ sine febre, &c. and points out the degree of stimulus necessary to restore health.

From (H) to (O) includes those variations which may be considered as compatible with health, while the corresponding stimuli are applied; but if inordinate or disproportionate stimuli be applied, in any state of the excitement, disease may be induced.

From (P) to (V) comprises the degrees of excitability, or indirect debility to the account of which almost the whole catalogue must be placed; for the diseases arising from accumulation often suddenly pass into those of exhaustion, in consequence of excessive stimuli.

From the above statement of this system, as far as respects the cure of diseases, it will be obvious, that the doses, as well as the medicines themselves, must be regulated by the state of the excitability; and that in ascertaining this state and proportioning the stimuli to it, is the only field in which the practitioner can exercise his skill and judgment.

Professor Hufeland admits, in concurrence with many other eminent physicians in Germany and England, that the inventor of this doctrine was a man of considerable genius, and that his theory is replete with novel and excellent ideas; notwithstanding which, it by no means merits the name of a *system*, as it every-where presents evident chasms and defects. The *constituent* part of medicine, as an art, must necessarily rest on the observation of facts, or what we call experience; theory is of service merely in the *regulative* part of it, and must invariably accommodate itself to fresh modifications and changes, whenever experience shall pronounce them necessary. The Brunonian doctrine appears very plausible and consistent in theory, but is liable to this material objection, that it frequently and essentially disagrees with matters of fact and experience. The principal point, therefore, to be considered is, whether the Brunonian mode of representing subjects in medicine has a tendency to facilitate the acquisition of medical knowledge, and to improve the method of curing diseases?

The learned professor seems inclined to put a negative on this question; and observes, that Brown's division of diseases into *sthenic* and *asthenic*, is only *apparently* simple and easy, but that it is in *reality* a matter of considerable doubt and difficulty to distinguish them from one another with precision; and there are certain distempers, in which it is almost impossible to trace and discover the symptoms of the sthenic and asthenic constitution. It is further difficult to establish clearly, where there is *direct*, and where there is *indirect* debility; to ascertain to what degree this subsists in the body, and determine what species of stimulus ought to be applied to it. In our opinion, medicine can derive little *positive* advantage from the multiplication of theories, however ingeniously framed, if they be not founded on the basis of actual observation and experience. Instead of indulging the modern rage

for *generalization*, we ought previously to collect a sufficient number of analogous facts; and, being in possession of these, we might gradually and cautiously venture to reduce them to particular classes, orders, &c. But as this result pre-supposes long and attentive investigation, by a cool, persevering, and unprejudiced mind (circumstances and qualifications but rarely united in an individual), there is little hope of seeing a *theory* of medicine or a *System of Nosology* established, which, in the present progressive state of medical and physical science, will be found of such unperishable materials, as to stand the test of future ages.

Whoever is anxious to obtain celebrity, and *really to improve the practice of the healing art*, will find it no easy matter to accomplish this desirable end by solitary disquisitions in his study-room: he must range through a circle of patients; examine and consult with them; and these, again, in like manner with him. Old and experienced practitioners will readily discover whether the author or founder of a system be in fact a stranger to the diseases he attempts to define or arrange; if in only a few instances they espy his weak side, and find his account of the progress of a disease inconsistent with the path of nature, his pretensions are instantly decried, and his whole system is placed on the condemned list. Brown was a *luxuriant genius*, and his medical eccentricities frequently exhibit somewhat of a marvellous, if not even a monstrous, appearance. We may, however, easily understand how it happens that this *soi-disant* system is now so fondly caressed and honoured with approbation, especially by young practitioners, before they can have treasured up a fund of original experience; as, thus fortified, they approach the bed of the patient with a certain conscious air of veteran firmness. In the aphoristical doctrines of Bruno, they find every subject of this complicated art treated in a much easier, more concise, and convenient manner, than in the old-standing authorities of former ages: instead of studying, in well-arranged elementary treatises, the nature of every disease, according to its different stages, symptoms, &c. and making themselves acquainted with methods of cure adapted to the particular state of the disorder, as well as the peculiar constitution, temperament, and external conditions of the patient; they congratulate themselves that such diffuseness is *now* perfectly unnecessary, innumerable diseases being classed under one head, and treated in a similar manner, in this comprehensive mode of classification; for instance, in hæmoptysis, as well as in diarrhœa, hysterics, &c. &c. Dr. Brown indiscriminately recommends the use of chalybeates, rum, opium, and the like. This, surely, will be more readily understood in theory, and followed in practice, than the old elaborate or pedantic diffuseness, by which the study of medicine is rendered difficult to the tyro, and the practice of it puzzling, if not baffling, to the beginner.

BRUNSFELSIA, a genus in Linnæus's botany. There is but one species.

BRUSCUS. See Ruscus.

BRUSH, a well-known implement for domestic purposes. Some medical ends are obtained by friction with brushes of a proper size and quality, in rheumatic affections of the joints, paralytic numbness of the extremities, &c. Mr. Molwitz, of Stutgard, describes an instrument, which he calls the *Metallic Brush*, and from which, full as good effects may be expected as from metallic *tractors*. He is, however, of opinion, that the action of both instruments is merely mechanical; but he particularly recommends the Metallic Brush, as uniting all the different effects of mechanical stimuli, as that of friction, pressure, topical irritation, &c. This instrument consists of a small wheel, about one foot in diameter, made of any light wood, which has on its right a handle for turning it, and on its left a wooden handle for the left hand, at which it moves through the medium of an iron axle. On its periphery, which is about one inch and a half broad, are fastened bunches of wire, two or three inches long, the tops of which end in small knobs, like the heads of pins. Nothing material consists in the size of the knobs, or the length of the wire, nor in the direction of the bunches. See Pl. VI.

BRUSH, in electricity, denotes the luminous appearance of the electric matter issuing in a parcel of diverging rays from a point. Beccaria ascribes this appearance to the force with which the electric fluid, going out of a point, divides the contiguous air, and passes through it to that which is more remote.

BRUSH IRON; a species of *Flos Ferri*, of a columnar figure: it consists of rude irregular columns, which lie parallel; it is found in the forest of Dean. The individuals of this species frequently have pretty regular columns, and, a degree of transparency.

BRUTE, a general name for all animals except mankind. Among brutes, the monkey kind bear the nearest resemblance to man; both in the external shape and internal structure, but more in the former than in the latter. In the monkey kind, the highest and the nearest approach to the likeness of man is the Ouran Outang, or Homo Sylvestris.—The structure and economy of brutes are the objects of what is called Comparative Anatomy. See that article. Philosophers have been much puzzled about the essential characteristics of brutes, by which they may be distinguished from man. Some define a brute to be an *animal not risible*, or a *living creature incapable of laughter*; others

call them *mute animals.* The peripatetics allowed them a sensitive power, but denied them a rational one. The Platonists allowed them reason and understanding, though in a degree less pure and refined than that of men. Lactantius allows every thing to brutes which men have, except a sense of religion.

BRUTUA. See PAREIRA BRAVA.

BRU'XANELI, a tall tree in Malabar; its bark is diuretic.

BRYAMUS, a term denoting a peculiar kind of noise, such as is made by gnashing or grating the teeth; or, according to some, a certain kind of convulsion affecting the lower jaw, and striking the teeth together, most frequently observed in such children as have worms.

BRYONIA, BRYONY; a genus of the syngenesia order, belonging to the dioecia class of plants; and in the natural method ranking under the 34th order, *Cucurbitaceæ.* The calyx of the male is five-toothed, with a quinquefid corolla, and three filaments. In the female the calyx is dentated, the corolla quinquefid, the style trifid with a roundish many-seeded berry.

The species are, 1. The *alba*, rough or white bryony with red flowers, is a native of dry banks under hedges in many parts of Britain. The roots of this plant have, by impostors, been brought into a human shape, and shown for mandrakes. The method practised by these people was to find a young thriving plant of bryony; then they opened the earth all round, being careful not to disturb the lower fibres; and being provided with such a mould as is used for making plaster figures, they fixed the mould close to the root, fastening it with wire to keep it in its proper situation: then they filled the earth about the root, leaving it to grow to the shape of the mould; which in one summer it will do; so that if this is done in March, by September it will have the shape. The leaves of this plant are also imposed on people for mandrake-leaves; although there is no resemblance between them, nor any agreement in quality. 2. The *africana*, or African tuberous rooted bryony. 3. The *racemosa*, or bryony with a red olive-shaped fruit. These are natives of warm climates, and are perennial; but their branches decay every winter. They flower in July, and in warm summers will perfect their seeds in Britain. 4. The *cretica*, or spotted bryony of Crete. 5. The *variegata*, or American bryony with a variegated fruit. 6. The *bonariensis*, or bryony with hairy palmated leaves, divided into five parts, and obtuse segments. These are likewise natives of warm countries; but merit cultivation on account of the pretty appearance they make when the plants are full of fruit.

The *bryonia alba* Linn.; *bryonia foliis palmatis utrinque calloso-scabris*; has been formerly very much, and still is occasionally, used in medicine. The roots are sometimes as thick as a man's thigh: their smell, when fresh, is strong and disagreeable; the taste nauseously bitter and acrid. The juice is so sharp, as in a little time to excoriate the skin; in drying, they lose great part of their acrimony, and almost their whole scent. Bryony-root is a strong irritating cathartic; and has been exhibited in maniacal cases, in dropsies, and in several chronic diseases. An extract prepared by water acts more mildly, and with greater safety, than the root in substance: given from half a dram to a dram, it is said to prove a gentle purgative, and likewise to operate powerfully by urine.—Bryony-root is directed, in the *Pharmacopœia Chirurgica*, in the composition of a stimulating plaster and cataplasm.

Emplastrum Bryoniæ Compositum.

℞ Radicis bryoniæ, in pulverem triti, unc. ij
Florum sulphuris unc. j
Hydrargyri cum sulphure drach. iij
Galbani colati unc. iv
Emplastri ceræ compositi unc. ix
Olei olivæ unc. j.

The three last ingredients being melted together, the powders are to be stirred in.

This, which is one of Boerhaave's plasters, notwithstanding its singular composition, is said to have been employed by the late Mr. Pott, who found it a beneficial application to scrofulous indurations.

Cataplasma Bryoniæ Compositum.

℞ Radicis bryoniæ unc. iij
Florum sambuci unc. j
Gummi ammoniaci unc. ss
Ammoniæ muriatæ drach. ij
Spiritus camphorati unc. j.

After boiling the briony and elder flowers till they become tender, they must be bruised, and the gum ammoniac, previously dissolved in vinegar, must be added to them. The muriated ammonia and the camphorated spirit are lastly to be joined, and the whole mixed together into a cataplasm.

BRYO'NIA ALBA; the systematic name of the plant from which the *radix bryoniæ* of the pharmacopœias is obtained. See BRYONIA.

BRYONY WHITE; the English name of the *Bryonia alba* Linn. See BRYONIA.

BU'BO, (from βουβων, *the groin;* because buboes most frequently happen in that part); an inflammation of a conglobate gland. Dr. Cullen arranges this disease in the class *locales* and order *tumores.* Even a simple swelling of any of the lymphatic glands of the body is called a

bubo: but when such a swelling proceeds from venereal poison, it is termed a *venereal bubo.* These seldom or never appear except in the lymphatic glands of the groin, arm-pit, or extremities, and much more frequently in the groin than anywhere else.

In the treatment of buboes, a strict antiphlogistic regimen is to be used to promote a resolution; the application of leeches to the hardened gland is particularly proper. In discussing venereal buboes, the application of mercurial ointment has a considerable effect. After suppuration is completely formed, the application of caustic to open the bubo is requisite, lest it should corrode some of the considerable blood-vessels, which generally lie contiguous to the bubo. During the remaining part of the cure, mercury joined with opium is to be used. This, in few words, is the usual practice in these cases; but as the most serious consequences are apt to result from errors of the surgeon, it is of the utmost importance that he should be made acquainted with the doctrines of Mr. Hunter, who in his excellent treatise on the venereal disease, has given the following account of this often formidable symptom.

Our present knowledge of the *absorbing system*, gives us the most important information respecting many of the effects of poisons, and illustrates several symptoms of the venereal disease, in particular that of which we are now to treat. "Prior to this knowledge," says Mr. Hunter, "we find writers at a loss how to give a true and consistent explanation of many of the symptoms of this disease. The discovery of the lymphatics being a system of absorbents has thrown more light on many diseases than the discovery of the circulation of the blood; it leads in many cases directly to the cause of the disease.

"The immediate consequence of the local diseases gonorrhœa and chancre, which is called bubo, as also the remote, or lues venerea, arise from the absorption of recent venereal matter from some surface where it has either been applied or formed. Although this must have been allowed in general ever since the knowledge of the disease and of absorption, yet a true solution of the formation of bubo could not be given till we had acquired the knowledge of the lymphatics being the only absorbents. Upon the old opinion of absorption being performed by the veins, the lues venerea could have easily been accounted for, because it could as readily be produced by the absorbing power of the veins, if they had such, as by the lymphatics; but the difficulty was to say how the bubo was formed. There they seemed to be at a loss to account for this disease, yet they sometimes expressed themselves as if they had some idea of it, although at the same time they could have no clear notions of what they advanced; nor could they demonstrate what they said from the knowledge of the parts and their uses.

"Buboes are by some imputed to the stopping of a gonorrhœa, or, as they expressed it, driving it to the glands of the groin, conformably to the idea they had of the swelling of the testicle. But this is not just, for we know of no such power as repulsion; and if it was driven there, it could not be by stopping the formation of matter, but by increasing the absorption, of which they had no idea."

Mr. Hunter here examines the opinions of authors concerning the formation of a bubo, and proves that, prior to the knowledge of the power of absorption in the lymphatics, they have made use of terms which they could not possibly understand, and that, till we come so low down as the year 1770, nothing was clearly understood on the subject. At that period, in an abridgement of Astruc by Dr. Chapman (second edition), in which he introduces his own knowledge and ideas, we find the absorbing power of the lymphatics brought in as a cause of the formation of buboes.

Conceiving the doctrine of absorption to be now understood, Mr. Hunter proceeds to explain the different modes in which it may take place under circumstances of a venereal infection.

"The venereal matter," says he, "is taken up by the absorbents of the part in which it is placed, and although the absorption of the matter and the effects after absorption are the same, whether from the matter of the gonorrhœa, or chancre, yet I shall divide the absorption into three kinds, according to the three different surfaces from which the matter may be absorbed, beginning with the least frequent.

1. "The first and most simple is where the matter either of a gonorrhœa or chancre has only been applied to some sound surface, without having produced any local effect on the part, but has been absorbed immediately upon its application. Instances of this I have sometimes seen in men, and such are, perhaps, the only instances that can be depended upon; for it is uncertain in many cases, whether a woman has a gonorrhœa or not. I think, however, I may venture to affirm, that I have seen it in women, or at least there was every reason to believe that they had neither chancre nor gonorrhœa preceding, as there was no local appearance of it, nor did they communicate it to others who had connection with them.

"It must be allowed that this mode of absorption is very rare; and if we were to examine the parts very carefully, or enquire of the patient very strictly, probably a small chancre might be discovered to have been the cause, which I have more than once seen. For when we consider how rarely it happens from a gonorrhœa, in which the mode of absorption is similar, we can hardly suppose it pro-

bable that it should here arise from simple contact, the time of the application of the venereal matter being commonly so very short. We might, indeed, suppose the frequency to make up for the length of time, which we can hardly allow, for the same frequency should give the chance of producing it locally. Therefore very particular attention should be paid to all the circumstances attending such cases.

"There is, however, no great reason why it should not happen, and the possibility of it lessens the faith that is to be put in the supposition, that the disease may be years in the constitution before it appears; for whenever it does appear in a lues venerea, its date is always carried back to the last local affection, whether gonorrhœa or chancre, and the latter connections are never regarded.

2. "The second mode of absorption of this matter is more frequent than the former, and it is when the matter applied has produced a gonorrhœa; and it may happen while the complaint is going on, either under a cure or not. Some of the matter secreted by the inflamed surfaces having been absorbed and carried into the circulation, produces the same complaints as in the former case, by which means a person gives himself the lues venerea.

3. "The third mode is the absorption of the matter from an ulcer, which may either be a chancre, or a bubo. This mode is by much the most frequent; which, with many other proofs, would show, that a sore or ulcer is the surface most favourable for absorption. Whether ulcers in every part of the body have an equal power of absorption I have not been able to determine; but I suspect that an ulcer on the glans, is not so good a surface for absorption as one on the prepuce, although I have seen both buboes and the lues venerea arise from the former, but not so often as from the latter."

4. To these three methods Mr. Hunter adds a fourth; viz. *absorption from a wound;* which is, perhaps, not so frequent as any of the former.

"As the venereal poison," says he, "has the power of contaminating whatever part of the body it comes in contact with, it contaminates the absorbent system, producing in it local venereal complaints. It is hardly necessary to observe, that what is now commonly understood by a bubo, is a swelling taking place in the absorbing system, especially in the glands, arising from the absorption of some poison, or other irritating matter; and when such swellings take place in the groin, they are called buboes, whether from absorption or not, but are most commonly supposed to be venereal, even although there has been no visible preceding cause. This has been so much the case, that all swellings in this part have been suspected to be of this nature; femoral ruptures, and aneurisms of the femoral artery, have been mistaken for venereal buboes."

Mr. Hunter calls every abscess in the absorbing system, whether in the vessels or the glands, arising in consequence of the absorption of venereal matter, by the name of a *bubo.*

"This matter," continues he, "when absorbed from either of the four different surfaces, which are common surfaces, wounds, inflamed surfaces, and ulcers, is carried along the absorbent vessels to the common circulation, and in its passage often produces the specific inflammation in these vessels; the consequence of which is, the formation of buboes, which are venereal abscesses, exactly similar in their nature and effects to a chancre; the only difference being in size. As the absorbents with the glands are immediately irritated by the same specific matter which has undergone no change in its passage, the consequent inflammation must therefore have the same specific quality, and the matter secreted in them be venereal.

"As this system of vessels may be divided into two classes, the vessels themselves, and their ramifications and convolutions, called the lymphatic glands, I shall follow the same division in treating of their inflammations.

"Inflammation of the vessels is not nearly so frequent as that of the glands. In men, such inflammations, in consequence of chancres upon the glans or prepuce, generally appear like a chord leading along the back of the penis from the chancres. Sometimes they arise from the thickening of the prepuce in gonorrhœas, that part in such cases being generally in a state of excoriation, as was described when on that form of the disease. These chords often terminate insensibly on the penis, near its root, or near the pubes; at other times they extend further, passing to a lymphatic gland in the groin: this chord can be easily pinched up between the finger and thumb, and it often gives a thicknesss to the prepuce, making it so stiff at this part as to make the inversion of it difficult, if not impossible, producing a kind of phymosis.

"I think I have observed this appearance to arise as frequently from the gonorrhœa, when attended with the before-mentioned inflammation and tumefaction of the prepuce, as from chancres; which, if my observation be just, is not easily accounted for. I have observed, that absorption is more common to ulcers than inflamed surfaces; or at least the formation of a bubo in the gland, and its effects in the constitution, are more common from an ulcer; but it may be remarked, that the inside of the prepuce, from whence this chord appears to arise, is in an excoriated state. It is possible that this effect may arise from the lymphatics sympathising with the inflammation of the urethra; but I believe the affection is truly venereal; or it

is possible that even the absorption of the coagulable lymph which was produced from the venereal inflammation, and which is the cause of the tumefaction, may have the power of contamination, as appears to be the case in the cancer.

" The thickening, or the formation of this hard chord, probably arises from the thickening of the coats of the absorbents, joined with the extravasation of coagulable lymph, thrown in upon its inner surface, as in inflamed veins.

" This chord often inflames so much as to suppurate, and sometimes in more places than one, forming one, two, or three buboes, or small abscesses, in the body of the penis. When this is going on, we find in some parts of this chord a circumscribed hardness, then suppuration takes place in the centre, the skin begins to inflame, the matter comes nearer to it, and the abscess opens like any other abscess."

Mr. Hunter says he has seen a chain of these little abscesses running along the upper part of the penis through its whole extent.

" This," says he, " may be supposed to be exactly similar to the inflammation and suppuration of a vein after being wounded and exposed.

" Inflammation of the glands is much more frequent than the former, and arises from the venereal matter being carried on to the lymphatic glands; the structure of which appears to be no other than the ramifications and reunion of the absorbent vessels, by which means they form these bodies.

" From this structure we may reasonably suppose that the fluid absorbed is in some measure detained in these bodies, and thereby has a greater opportunity of communicating the disease to them than to the distinct vessels, where its course is perhaps more rapid; which may account for the glands being more frequently contaminated.

" Swellings of these glands are common to other diseases, and should be carefully distinguished from those that arise from the venereal poison. The first enquiry should be into the cause, to see if there is any venereal complaint at some greater distance from the heart, as chancres on the penis, or any preceding disease on the penis; to learn if mercurial ointment has been at all applied to the leg and thigh of that side; for mercury applied to those parts for the cure of a chancre will sometimes tumefy the glands, which has been supposed to be venereal. We should further observe, if there be no preceding disease in the constitution, such as a cold, fever, &c. the progress of the swelling with regard to quickness is also to be attended to, as also to distinguish it from a rupture, lumbar abscess, or aneurism of the cural artery.

" Perhaps these bodies are more irritable, or more susceptible of stimuli, than the vessels, they are certainly more susceptible of sympathy; however, we are not yet sufficiently acquainted with the use of these glands to be able to account satisfactorily for this difference.

" It would appear in some cases, that it is some time after the absorption of the venereal matter before it produces its effects upon the glands; in some it has been six days at least. This could only be known by the chancres being healed six days before the bubo began to appear; and in such cases it is more than probable that the matter had been absorbed a much longer time before, for the last matter of a chancre most probably is not venereal; and indeed it is natural to suppose that the poison may be as long before it produces an action on the parts, when applied in this way, as it is either in the urethra, or in forming a chancre; which I have shown to be sometimes six or seven weeks.

" The glands nearest to the origin of the disease are in general the only ones that are attacked, as those in the groin, when the matter has been taken up from the penis in men. In the groin, between the labia and thigh, and the round ligaments, when absorbed from the vulva, in women.

" I think there is commonly but one gland at a time that is affected by the absorption of venereal matter, which, if so, becomes in some sort a distinguishing mark between venereal buboes and other diseases of these bodies.

" We never find the lymphatic vessels, or glands, that are second in order, affected; as those along the iliac vessels, or back; and I have also seen when the disease has been contracted by a sore or cut upon the finger, the bubo come on a little above the bend of the arm, upon the inside of the biceps muscle; and in such where the bubo has come in that part, none have formed in the arm-pit, which is the most common place for the glands to be affected by absorption.

" But this is not universal, although common, for I was informed by a gentleman who contracted the disease in the before-mentioned way, that he had buboes both on the inside of the biceps muscle, and in the arm-pit. Another case of this kind I have heard of since: why it is not more common is perhaps not easily explained.

" It might be supposed that the matter was weakened or much diluted by the absorptions from other parts by the time it gets through these nearest ramifications, and therefore has not power to contaminate those which are beyond them; but it is most probable that there are other reasons for this. I once suspected that the nature of the poison was altered in these glands as it passed through them, which was the reason why it did not contaminate the second or third series of glands; and also why it did not affect the constitution in the same way as it did the parts to which it was first applied; but this explanation will not account for the next order of glands to suppurating buboes not being affected

by the absorption of venereal matter. It appears to me that the internal situation of the other glands prevents the venereal irritation from taking place in them; and this opinion is strengthened by observing when one of these external glands suppurates and forms a bubo, which is to be considered as a large venereal sore or chancre, that the absorption from it, which must be great, does not contaminate the lymphatics or glands next in order, by the venereal matter going directly through them.

" If this be true, then the skin would seem to be the cause of the susceptibility of the absorbents to receive the irritation. Whether the skin has the power inherent in itself, or acquires it from some other circumstance, as air, cold, or sense of touch, is not easily ascertained, but whichever it be, it shows that the venereal matter of itself is not capable of irritating, and that it requires a second principle to complete its full effect, that is, a combination of the nature of the poison and the influence of the skin, and that influence must be by sympathy, and therefore weaker than if acting in the same part, that is the skin itself; which perhaps is the reason why the venereal matter does not always affect those vessels and glands, while it always does the skin, if inserted into it.

" The situation of buboes arising from the venereal disease in the penis, are, in men, in the absorbent glands of the groin; if a gonorrhœa is the cause of a bubo, one groin is not exempted more than the other, both may be affected; but if a bubo arises in consequence of a chancre, then the groin may be generally determined by the seat of the chancre; for if the chancre is on one side of the penis, then the bubo will commonly be on that side; however this is not universally the case, for I have known instances, although but few, where a chancre on one side of the prepuce, or penis, has been the cause of a bubo on the opposite side, which, if arising from that chancre, is a proof that the absorbents either anastomose, or decussate each other. If the chancre be on the frænum, or on the middle of the penis, between the two sides, then it is uncertain which side will be affected."

The situation of the glands of the groin is not always the same, and therefore the course of the absorbent vessels will vary. Accordingly buboes may take place either higher or lower than usual, and indeed no part of the body, under certain circumstances, is exempt from the disease, since every gland is capable of venereal infection.

Buboes as they appear in women, are thus spoken of by Mr. Hunter.

" One would naturally suppose," says he, " that what has been said of this complaint in the lymphatic glands in men, would be wholly applicable to women; and also that nothing peculiar to women could take place; but the seat of absorption is more extensive in this sex, and the course of some of the absorbents is also different, from whence there are three situations of buboes in women, two of which are totally different from those in men, and these I suspect to be in the absorbents. The third situation of buboes in this sex is similar to that in men, and therefore may be divided into three, as in men.

" When buboes arise in women where there is no chancre, it is more difficult to know whether they are venereal or not than in men; for when they arise in men without any local complaint, it is known that no such complaint exists, and therefore the bubo cannot be venereal, excepting by immediate absorption; but in women it is often difficult to know whether there be any infection present or not; and therefore in order to ascertain the nature of the bubo, attention must be paid to its manner of coming on, progress, and other circumstances.

" When chancres are situated forwards, near to the meatus urinarius, nymphæ, clitoris, labia, or mons veneris, then we find that the matter absorbed is carried along one or both of the round ligaments and the buboes are formed in those ligaments just before they enter the abdomen, without, I believe, ever going further. These buboes I suspect not to be glandular, but inflamed absorbents; and if so, it strengthens the idea that it is only an external part that can be affected in this way.

" When the chancres are situated far back, near the perinæum, or in it, the matter absorbed is carried forwards along the angle between the labium and the thigh to the glands in the groin, and often in this course there are formed small buboes in the absorbents, similar to those on the penis in men; and when the effects of the poison do not rest here, it often produces a bubo in the groin as in men."

Speaking of the inflammation of buboes, and particularly of the signs that distinguish them from other swellings of the glands, Mr. Hunter says,

" The bubo commonly begins with a sense of pain which leads the patient to examine the part, where a small hard tumor is to be felt. This increases like every other inflammation that has a tendency to suppuration; and, if not prevented, goes on to suppuration and ulceration, the matter coming fast to the skin.

" But we find cases where they are slow in their progress, which I suspect either arises from the inflammatory process being kept back by mercury, or other means; or being retarded by a scrofulous tendency, such a disposition in the parts not so readily admitting the true venereal action.

" At first the inflammation is confined to the gland, which is moveable in the cellular membrane; but as it increases in size, or as the inflammation,

and more especially the suppuration, advances, which in all cases produce rather a common effect than a specific, the specific distance is exceeded, the surrounding cellular membrane becomes more inflamed, and the tumor is more diffused. Some become erysipelatous, by which means they are rendered more diffused and œdematous, and do not readily suppurate, a circumstance often attending the erysipelatous inflammation.

" To ascertain what a disease is, is the first step in the cure; and when two or more causes produce similar effects, great attention is necessary to distinguish one effect from another, so as to come at the true cause of each.

" The glands of the groin, from their situation, are liable to suspicion, for besides being subject to the common diseases, they become exposed to others by allowing whatever is absorbed to pass through them; and as the route of the venereal poison to the constitution is principally through them, and being oftener ill from this cause than any other, they often are suspected of this disease without foundation.

" To distinguish with certainty the true venereal bubo from swellings of those glands arising from other causes, may be very difficult. We must, however, examine all circumstances, to ascertain in what the bubo differs from the common diseases of those glands, whether in the groin or elsewhere; in which examination the apparent causes are not to be neglected. I have already given the character of the venereal bubo in general terms; but I shall now be more particular, as the two are to be contrasted.

" The true venereal bubo, in consequence of a chancre, is most commonly confined to one gland. It keeps nearly its specific distance till suppuration has taken place, and then becomes more diffused. It is rapid in its progress from inflammation to suppuration and ulceration. The suppuration is commonly large for the size of the gland, and but one abscess. The pain is very acute. The colour of the skin where the inflammation attacks is of a florid red.

" It may be observed, that the buboes in consequence of the first mode of absorption, viz. where no local disease had been produced, will always be attended with a greater uncertainty of the nature of the disease than those attended or preceded by a disease in the penis; because a simple inflammation and suppuration of these glands is not sufficient to mark it to be venereal; but as we always have this disease in view when such parts as the glands of the groin are the seat of the disease, the patient runs but little risk of not being cured if it should be venereal; but I am afraid that patients have often undergone a mercurial course when there has been no occasion for it.

" It will perhaps be difficult to find out the specific difference in the diseases themselves; but I think that such buboes as arise without any visible cause are of two kinds, one similar to those arising from chancres and gonorrhœa; that is, inflaming and suppurating briskly. These I have always suspected to be venereal; for although there is no proof of their being so, yet from these circumstances it is a strong presumption that they are.

" The second are generally preceded and attended with slight fever, or the common symptoms of a cold, and they are generally indolent and slow in their progress. If they should be more quick than ordinary, they become more diffused than the venereal, and may not be confined to one gland. When very slow they give but little sensation; but when more quick the sensation is more acute, though not so sharp as in those that are venereal; and most commonly they do not suppurate, but often become stationary. When they do suppurate it is slowly, and often in more glands than one, the inflammation being more diffused, and commonly small in proportion to the swelling. The matter comes slowly to the skin, not attended with much pain, and the colour is different from that of the other, being more of the purple. Sometimes the suppurations are very considerable, but not painful."

Mr. Hunter next enquires what other causes there are for the swelling of these glands besides venereal infection, to which he has ascribed one of the modes of swelling; for other causes there must be to account for the other modes of it. He says,

" The first thing to be attended to is, whether or not there are any venereal complaints; and if not, this becomes a strong presumptive proof that they may not be venereal, but proceed from some unknown cause. If the swelling is only in one gland, very slow in its progress, and gives but little or no pain, it is probably merely scrofulous; but if the swelling is considerable, diffused and attended with some inflammation and pain, then it is most probable that there is a constitutional action, consisting in slight fever, the symptoms of which are lassitude, loss of appetite, want of sleep, small quick pulse, and an appearance of approaching hectic. Such swellings are slow in their cure, and do not seem to be affected by mercury, even when very early applied."

The case, introduced by the author to illustrate this subject, is well worthy of the reader's attention: " The swellings that took place were not very painful, and, after having acquired a considerable size, became stationary. Mercurial ointment, rubbed on the leg and thigh of the side affected, did not appear to be of any service to them, as they still remained stationary, and almost without pain. With respect to the cure, Mr. Hunter thought the patient should go to the sea and bathe.

" Allowing the chance of the disease being vene-

real or not venereal," says he, "to be equal, I reasoned upon that ground. His present want of health could not be supposed to arise from any venereal cause, as it was prior to the swelling in the groin, and therefore though the swelling was venereal, he was not at present in a condition to take mercury, as a sufficient quantity of that medicine for the cure would kill him; and if it should not be venereal, that still a greater quantity of mercury must be given than what was necessary if it was venereal; because its not giving way readily would naturally make the surgeon push the mercury further; and besides this disagreeable circumstance, the disease in the groin might be rendered more difficult of cure. But if he went to the sea, his constitution would be restored; and if the disease in the groin proved to be venereal, he would be in a proper condition to go through a mercurial course, and by that means get rid of both diseases by the two methods. But if I should be right in my opinion, that there was nothing venereal in the case, then he would get well by the sea-bathing alone.

"These arguments had the desired effect, the patient went directly to the sea, and began to recover almost immediately. About a fortnight after a small suppuration took place in one of the glands; I directed a poultice should be made with sea-water and applied, and if it broke that it should not be further opened, but poulticed till healed. In six weeks he came back perfectly recovered in every respect.

"The above appearance, with the constitutional affections, I have seen take place when there were chancres, and I have been puzzled to determine whether it was sympathetic, from a derangement of the constitution, or from the absorption of matter.

"I have long suspected a mixed case, and I am now certain that such exists. I have seen cases where the venereal matter, like a cold or fever, has only irritated the glands to disease, producing in them scrofula, to which they were predisposed.

"In such cases the swellings commonly arise slowly, give but little pain, and seem to be rather hastened in their progress if mercury is given to destroy the venereal disposition. Some come to suppuration while under this resolving course; and others, which probably had a venereal taint at first, become so indolent that mercury has no effect upon them, and in the end get well either of themselves, or by other means, which I imagine may have induced some to think that buboes are never venereal. Such cases require great attention to be able to determine them properly; and I believe this requires in many cases so nice a judgment that we shall be often liable to mistakes."

Whether the lymphatic glands act as guards against the further progress of any disease caught by absorption, Mr. Hunter cannot determine; they cannot however prevent the poison from getting a passage into the constitution in cases where buboes take place, because these glands naturally propagate the same disease as has been produced in them, and in an increased degree.

Mr. Hunter makes the following general reflections on the cure of buboes. He declines a discussion of the opinion of their being a deposit from the constitution, and of the conclusion drawn from this opinion, that they ought not to be dispersed; "for," says he, "according to this theory, to disperse them would be to throw the venereal matter upon the constitution. But if this were really the case, then there would be no occasion for the use of mercury, provided that the bubo be allowed to proceed, as it would prove its own cure; but even those who were of this opinion were not satisfied with the cure which they supposed nature had pointed out, but gave mercury, and in very large quantities. From the same history of a bubo, I have also endeavoured to show that there are several buboes which are not in the least venereal, but scrofulous; and that there are also buboes which appear to be only in part venereal; or perhaps only a gland disposed to scrofula brought into action by the venereal irritation, similar to what happens often from the matter of the small-pox in inoculation. Therefore, prior to the method of cure, the true venereal bubo is to be distinguished from the others if possible. When it is well ascertained to be venereal, resolution is certainly to be attempted if the bubo be in a state of inflammation only. The propriety of the attempt depends upon the progress the disease has made. If it be very large, and suppuration appears to be near at hand, it is probable that resolution cannot be affected; and if suppuration has taken place, I should very much doubt the probability of success, and an attempt might now possibly only retard the suppuration, and protract the cure.

"The resolution of those inflammations depends principally upon mercury, and almost absolutely upon the quantity that can be made to pass through them; and the cure of them, if allowed to come to suppuration, depends upon the same circumstances. The quantity of mercury that can be made to pass through a bubo, depends principally upon the quantity of external surface for absorption beyond the bubo.

"Mercury is to be applied in the most advantageous manner, that is, to those surfaces by an absorption from which it may pass through the diseased gland; for by destroying the disease there the constitution has less chance of being contaminated. The powers of mercury may often be increased from the manner in which it is applied.

In the cure of buboes it should always be made to pass into the constitution by the same way through which the habit received the poison; and therefore to effect this, it must be applied to the mouths of those lymphatics which pass through the diseased part, and which will always be placed on a surface beyond the disease.

"But the situation of many buboes is such as not to have much surface beyond them, and thereby not to allow of a sufficient quantity of mercury being taken in in this way; as for instance, those buboes on the body of the penis arising from chancres on the glans or prepuce.

"These two surfaces are not sufficient to take in the necessary quantity to cure those buboes in its passage through them; therefore, whenever the first symptoms of a bubo appear, its situation is well to be considered, with a view to determine if there be a sufficient surface to effect a cure, without having recourse to other means. It is first to be observed, whether the absorbent vessels on the body of the penis are affected, or the glands in the groin.

"If the disease be in the groin, it must be observed in which of the three situations of the bubo before taken notice of, it is; whether on the upper part of the thigh and groin, on the lower part of the belly before Poupart's ligament, or near to the pubes. If they are on the body of the penis, this shews that the absorbents leading directly from the surface of absorption are themselves diseased. If in the groin, and on the upper part of the thigh, or perhaps a little lower down than what is commonly called the groin, then we may suppose it is in the glands common to the penis and thigh. If high up, or on the lower part of the belly, before Poupart's ligament, then it is to be supposed that those absorbents that arise from about the groin, lower part of the belly, and pubes, pass through the bubo; and if far forwards, then it is most probable that only the absorbents of the penis, and skin about the pubes, pass that way. The knowledge of these situations is very necessary for the application of mercury for the cure by resolution, and for the cure after suppuration has taken place.

"The propriety of this practice must appear at once, when we consider that the medicine cannot pass to the common circulation without going through the diseased parts; and it must promote the cure in its passage through them; while at the same time it prevents the matter which has already passed, and is still continuing to pass into the constitution, from acting there, so that the bubo is cured, and the constitution preserved.

"But this practice alone is not always sufficient: there are many cases which mercury by itself cannot cure. Mercury can only cure the specific disposition of the inflammation; and we know that this disease is often attended with other kinds of inflammation besides the venereal.

"Sometimes the common inflammation is carried to a great height, at other times the inflammation is erysipelatous, and I suspect often scrofulous. We must therefore have recourse to other methods.

"Where the inflammation rises very high, bleeding, purging, and fomenting, are generally recommended. These will certainly lessen the active power of the vessels, and render the inflammation more languid, but they can never lessen the specific effects of this poison, which were the first cause, and are still in some degree the support of the inflammation. Their effects are only secondary; and if they reduce the inflammation within the bounds of the specific, it is all the service they can perform. If the inflammation be of the erysipelatous kind, perhaps bark is the best medicine that can be given; or if it be suspected to be scrofulous, hemlock; and poultices made with sea-water, may be of service.

"Vomits have been of service in resolving buboes, even after matter has been formed in them, and after they have been nearly ready to burst; this acts upon the principle of one irritation destroying another; and the act of sickness and vomiting perhaps gives a disposition for absorption."

Mr. Hunter mentions a remarkable instance of the removal of a bubo, though ready to burst, merely by sea-sickness. This happened to an officer at Lisbon, and when the sickness went off, he found the bubo was entirely gone, and it never afterwards troubled him.

The resolution of the inflammation of the absorbents of the penis, Mr. Hunter says, is to be attempted in both sexes by the use of mercury, topically and generally. This, he says, is necessary to prevent the lues venerea, as well as to cure the parts themselves. As to the quantity, it must be left to the surgeon, who must be guided by the signs of the original complaint, and the readiness with which the symptoms have already given way.

In attempting the resolution of buboes in the groin, Mr. Hunter says,

"It will be proper to apply the mercury according to the situation of the inflamed gland. If the bubo be in the groin, according to our first situation, then it is necessary to rub the mercurial ointment upon the thigh. This surface will in general absorb as much mercury as will be sufficient to resolve the bubo, and to preserve the constitution from being contaminated by the poison that may get into it; but if resolution does not readily take place, then the surface of friction may be increased, by rubbing the ointment upon the leg.

"But if the bubo be on the lower part of the belly, that is, in the second situation, then the ointment should be rubbed also upon the penis, scrotum, and belly; and the same if the bubo should

be still further forwards; for probably those glands receive the lymphatics from all the surfaces mentioned, as well as from the thigh and leg.

"The length of time the frictions should be continued, must be according to circumstances. If the bubo gives way, they must be continued till it has entirely subsided, and perhaps longer, on account of the cause of it, a chancre, which may not yield so soon as the bubo. If it still goes on to suppuration, the frictions may or may not be continued; for I do not know for certain if any thing is to be gained by their continuance in this state."

If the quantity of mercury used affect the mouth, its further use must be regulated accordingly. Mr. Hunter describes the treatment of buboes in other parts in the following way:

"As venereal buboes," says he, "arise from other modes of application of the poison besides coition, they are to be found in different parts of the body; but the hands appear to be next in the order of frequency. They arise in the arm-pit from wounds in the hands or fingers being contaminated by venereal matter, and reduced to chancres. In such cases it becomes necessary that the ointment should be rubbed on the arm and fore-arm; but this surface may not be sufficient, therefore we must apply it in another way, or to other parts, to produce its effects upon the constitution.

"I have seen a true venereal chancre on the middle of the lower lip produce a bubo on each side of the neck under the lower jaw, just upon the maxillary gland. By applying strong mercurial ointment to the under lip, chin, and swellings, they were resolved.

"The quantity of mercury necessary for the resolution of a bubo must be proportioned to the obstinacy of the bubo, stopping short of certain effects upon the constitution. If it be in the first situation, and yields readily upon rubbing in half a drachm of mercurial ointment, made of equal parts of quicksilver and hog's lard, every night, and the mouth does not become sore, or at most only tender, then pursuing this course till the gland is reduced to its natural size will be sufficient, and probably will be a good security for the constitution, provided the chancre, which may have been the cause of the bubo, heals at the same time. If the mouth is not affected in six or eight days, and the gland does not readily resolve, then two scruples, or a drachm, may be rubbed in every night; and if there be no amendment, then more must be rubbed in; in short, if the reduction is obstinate, the mercury must be pushed as far as can be done without producing a salivation.

"If there be a bubo on each side, then there cannot be so much mercury applied locally to each; for the constitution most probably could not bear double the quantity which is necessary for the resolution of one. But in such cases we must not so much mind the soreness of the mouth as when there is but one; however, the buboes must be allowed to go on to suppuration, rather than affect the constitution too much by the quantity of mercury; and therefore when there are two they are more likely to suppurate than where there is only one.

"In the second or third situation of buboes, if we find that most probably a sufficient quantity of mercury does not pass through them for their resolution, it may be continued to be thrown in by the leg and thigh to act upon the constitution, as has been already observed. The quantity taken in in this way must be greater than what would be necessary if the whole could be made to pass through the bubo. The mouth must be affected, and that in proportion to the state and progress of the bubo.

"This method of resolving buboes occurred to me at Bellisle, in the year 1761, where I had good opportunities of trying it upon the soldiers; and I can say with truth, that only three buboes have suppurated under my care since that time, and two of these were in one person, where a small quantity of mercury had considerable effects on the constitution, and therefore a sufficient quantity could not be sent through the two groins for their resolution; but in both cases the suppurations were small in comparison to what they threatened to be, which I impute to the mode of treatment.

"Many buboes, after every attempt, remain swelled without either coming to resolution or suppuration, but rather become harder and schirrous. Such I apprehend were either scrofulous at first, or became so when the venereal disposition was removed. The cure of them should be attempted by hemlock, sea-water poultices, and sea-bathing, as has been already observed."

In the treatment of buboes when they suppurate, Mr. Hunter introduces some new and important practical remarks. He says,

"After every known method has been used, buboes cannot in all cases be resolved, but will come to suppuration. They then become more an object of surgery, and are to be treated in some respects like any other abscess. If it be thought proper to open a bubo, it should be allowed to go on, thinning the parts as much as possible. The great advantage arising from this is, that these parts having become very thin, lose the disposition to heal, which gives the bottom of the abscess a better chance of healing along with the superficial parts; by this means too, a large opening is avoided, and the different modes made use of for keeping the skin from healing till the bottom is healed, become unnecessary.

"It may admit of dispute, whether the application of mercury should be continued or not through the whole suppuration. I should be inclined to con-

tinue it, but in a smaller quantity; for although the parts cannot set about a cure till opened, yet I do imagine that they may be better disposed to it, and I think that I have seen cases where suppuration took place although under the above practice, that were very large in their inflammation, but very small in their suppuration, which I imputed to the party's having taken mercury in the before-mentioned way, both before and while suppuration was going on.

"It has been disputed more in this kind of abscess than in others, whether it should be opened or allowed to burst itself; and likewise whether the opening should be made by incision or caustic.

"There appears to be nothing in a venereal abscess different from any other to recommend one practice more than another. The surgeon should in some degree be guided by the patient."

Mr. Hunter says he once opened two buboes in the same person, one immediately after the other. The first was with the lapis infernalis, which gave him considerable pain, and therefore he would have the other opened with a lancet, as the pain would only be momentary. But it was so great, and the soreness continued so long, while there was no pain in the other deadened by the caustic, after it had done its business, that next day he said if he was ever obliged to have one opened again it should be with caustic. There can be no doubt, indeed, of the preference due to the latter method.

"The constitution at the same time is to be attacked with mercury, either by applying it internally or externally; if the mercury is applied externally, it should be applied to that side, and beyond where the bubo is, as before directed in treating of the resolution of buboes, as it may have some influence on the disease in its passing through the part.

"Giving mercury in these cases answers two purposes, it assists the external applications to cure the buboes, and it prevents the effects of the constant absorption of the venereal matter from the sore.

"How far it is necessary to pursue the mercurial course with a view to prevention it is not possible to determine, but it may be supposed that it is necessary to give the same quantity to prevent a disease that would cure one that has already taken place. It will be necessary to continue the course till the bubo is healed, or till it has for some time lost its venereal appearance; but it may be difficult to ascertain this last fact; therefore we must have recourse to experience, not theory, and continue the course in general till the whole is healed, and even longer, especially if the bubo heals very readily; for we find in many cases that the constitution shall be still tainted after all; however some restrictions are to be made here, for I have already observed, that it often happens that buboes assume other dispositions besides the venereal, which mercury cannot cure, but will even make worse. It is therefore necessary to ascertain the distinction; which will be taken notice of."

After observing that the treatment of suppurating buboes in the other sex is the same as in men, the author makes some ingenious remarks on some of the consequences which buboes may occasion. Having formerly observed that the venereal disease was capable of bringing latent dispositions or susceptibilities into action, Mr. Hunter says, "this is remarkably the case with buboes, and I believe the disposition is more of the scrofulous kind than any other; whether this arises from the buboes being formed in lymphatic glands or not, is probably not easily determined.

"It sometimes happens that these sores, when losing, or entirely deprived of, the venereal disposition, form into a sore of another kind, and most probably of various kinds. How far it is a disease arising from a venereal taint, and the effects of a mercurial course jointly, is not certain, but most probably these two have some share in forming the disease. If this idea of it were just, it would become a specific disease, and be reducible to one method of cure; but I should suspect that either the constitution or the part has some, if not the principal, share in it; that is, the parts fall into a peculiar disease independent of the constitutional disease or method of cure; for if it arose out of the two first entirely, we might expect to meet with it oftener. So far as the constitution or the part has a share in forming this disease, it becomes more uncertain what the disease is, because it must in some degree partake of the constitution or nature of the part. I am apt to suspect something scrofulous in them, especially as they are diseases of the lymphatic glands.

"Such diseases make the cure of the syphilis much more uncertain, because when the sore becomes stationary, or the mercury begins to disagree, we are ready to suspect that the virus is gone, but this is not always the case; the virus is perhaps only less powerful than the new-formed disease, and as it were lies dormant, or ceases to act, and when the other becomes weaker, the venereal begins to show itself again."

Mr. Hunter says, the treatment in such cases is, to attack the predominant disease; but still the difficulty is to find out the disease, and whether it is or is not venereal. He relates some cases with a view to exhibit this difficulty, and from them is led to conclude, that there was *another disposition formed besides the venereal*, and which was put into action by the venereal irritation; somewhat of a *scrofulous* kind, and probably not purely of that nature.

"I have seen some buboes," says he, "most extremely painful and tender to almost every

thing that touched them, and the more mild the dressings that were applied, the more painful the parts became.

"In some the skin seems only to take on the disease. Ulceration going on in the surrounding skin, while a new skin forms in the centre and keeps pace with the ulceration, forming an irregular sore like a worm-eaten groove all round. This, like the erysipelatous inflammation, as also some others, appears to have only the power of contaminating the parts that have not yet come into action; and those that have already taken it seem to lose the diseased disposition, and heal readily." In some instances, it is added, they spread to an amazing extent, in which case their progress may be limited in some degree by the use of hemlock. Mr. Hunter relates a case in which this effect was invariably obtained by that remedy, though it did not effect a cure. It affords also a salutary caution as to the exhibition of that remedy in large doses. See CONIUM MACULATUM.

BUBO, PESTILENTIAL; a symptom of the plague. See PESTIS. A pestilential bubo, at it commencement, is described by Dr. Wilson, as a small, hard, round tumor, readily perceptible to the touch, about the size and shape of a pea. It is moveable under the skin, the appearance of which is not altered at an early period, the bubo lying at a greater or less depth, and the swelling not appearing externally. As the tumefied gland enlarges, it changes from a round to an oval shape, becoming at the same time less moveable. The integuments now begin to thicken, and the swelling to appear externally. The appearance of the bubo is often preceded by a sense of tightness and pain sometimes lancinating, or itchiness, in the part where it is about to appear, now and then by shivering. In many cases, however, the small swelling just described comes on without being preceded by any peculiar symptoms.

Some buboes are indolent and insensible, others very sensible and rapid in their progress. The t mor advancing quickly to suppuration, is generally regarded as favourable. When the buboes suppurate properly, De Mertens observes, and there is a separation of eschars from the carbuncles, with a remission of the febrile symptoms, the prognosis is good. No general rule, however, can be laid down. Cases where early suppuration takes place often prove fatal; and there are many histories of cases terminating favourably where the buboes were extremely indolent and terminated in resolution.

Dr. Wilson says, it is difficult to foresee in what a bubo will terminate. The fluctuation is often scarcely perceptible where suppuration has taken place, and buboes are sometimes resolved after fluctuation has been very evident. Their progress indeed is almost always more or less irregular, especially after the first week. At one time they seem advancing to suppuration, at another show a tendency to resolution. "But these variations," Dr. Russell remarks, "chiefly respected the integuments; for the gland itself, when carefully explored, was seldom found to alter, and where the tumor actually dispersed, it was not suddenly, but by slow degrees. Thus from the alteration in the teguments alone, the whole tumor, on a superficial view, seemed to lessen or increase, though the gland remained the same; and I am inclined to think that this deception was often the cause of the bubo being said to fluctuate, or to vanish in appearance entirely, and again return." He adds, however, at the same time, that he is far from thinking. "that this fluctuation was never real." And Chenot observes, "Vidimus quoque abruptam suppurationem, in his resuscitari ac demum per effusionem puris absolvi."

The bubo, as it increases in size, becomes somewhat flat; and generally about the second week the skin over it grows tense and painful, and begins to be inflamed. In some cases the inflammation is moderate, in others considerable; but it seldom terminates in gangrene, although the skin now and then assumes a bluish colour. It sometimes happens, however, that the bubo runs to suppuration without any degree of inflammation appearing on the skin, and then, as it is generally harder than a suppurated venereal bubo, it is often difficult to determine whether suppuration has taken place or not. When buboes break spontaneously it generally happens in the third week, sometimes at a later period.

Pestilential buboes most frequently appear in the groins or a little lower, among the lowest cluster of the inguinal glands; they also frequently appear among the axillary glands; sometimes, though more rarely, they have their seat in the parotid, and the disease is then, by many, reckoned more dangerous than when the buboes appear in the groins or armpits. Still more rarely they appear in the maxillary or cervical glands.

"The latter too," namely, the maxillary and cervical glands, Dr. Russell remarks, "were seldom observed to swell without either the parotid swelling at the same time or soon after, or a carbuncle protruding near them; they never were the sole pestilential eruptions, and I recollect few instances of their coming to maturation." It has been remarked by others, that the parotid bubo seldom appears unaccompanied by one or more in the axilla or groin. It may upon the whole be observed, that the axillary buboes suppurate more frequently than those situated about the fauces, and the inguinal more frequently than the axillary.

Buboes often make their appearance on the first day of the complaint; sometimes, indeed, they are among the first symptoms. It has been observed,

that when they appear later than the third or fourth day, they are generally preceded by an exacerbation of the febrile symptoms. Those which come out at so late a period, however, are not, for the most part, the first which appear in the course of the complaint; for a succession of buboes sometimes takes place, till three or four have made their appearance. In this case several hours usually intervene between the appearance of any two of them.

It sometimes happens that no buboes appear, and these cases are upon the whole the most fatal. This is a circumstance which particularly demands attention, as the cases unattended by buboes and other pestilential eruptions generally make their appearance at the commencement of the epidemic, and have often, in consequence of the absence of the eruptions, been mistaken for other complaints. In other cases, particularly towards the decline of the epidemic, the buboes and other eruptions often form the principal part of the complaint, which is then unattended by danger; from which it would appear, that the eruptions in the plague are to be regarded as favourable symptoms.

Where the inflamed gland advances to suppuration more rapidly than the integuments, troublesome fistulous ulcers are sometimes formed, if an artificial opening has not been made in the skin. This accident, however, is rare; in general the buboes, left to themselves, do not prove troublesome.

When they do not suppurate, and the patient recovers, they gradually disperse, generally in the space of a few weeks. In some cases they are succeeded by an induration of the gland, which remains for many months. Even where suppuration has taken place, if the cure proves tedious, either in consequence of the matter having been discharged by too small an opening, or the opening having repeatedly closed in the progress of the cure, a similar induration sometimes succeeds, which in like manner sooner or later disappears, these indurations never terminating in cancer.

Such are the circumstances which Dr. Wilson says, are to be learned from attending to the external appearances of pestilential buboes; some further circumstances, of less moment, however, have been ascertained by dissection.

It has been the practice of many, particularly the French surgeons, to extirpate the buboes; which gave them an opportunity of observing the internal changes which take place in them. From the appearances on dissection they have been divided into several different species. It is unnecessary to detain the reader with an account of this hitherto useless division; he will find it at length in the "Traité de la Peste" from the 428th to the 434th page. One observation deserves attention; it has just been remarked, that the skin covering the buboes never runs to gangrene; dissection shows that it is otherwise with respect to the gland itself. A French writer says,—"Je coupai par le milieu celle (*h. e.* the bubo), qui etoit sur les vaisseaux, que je trouvai toute noire. Le lendemain j'ouvris le bubon, j'y trouvai le corps glanduleux comme un rein de mouton, tout noir."

Besides the true bubo, another pestilential eruption has also received the name of bubo. This eruption is so rare that some who mention it have been accused of misrepresentation. This accusation, however, we are now assured is groundless. The principal circumstance in which the spurious differs from the true bubo, is in the former appearing indiscriminately on almost every part of the body; while the true bubo is confined to the groin, axilla, and parts about the fauces. "Spurious buboes were observed," says Dr. Russell, "on the head, the forehead, the throat, the shoulder, above the clavicle, the neck, on or above the scapulæ, the back, the side under the breast, the belly, the hip, hind part of the thigh near the ham, the leg, the scrotum, the arm near the usual place of issues, inside of the arm near the elbow, outside of the fore-arm, and near the wrist."

Some of these buboes, if they are not opened at a proper time, grow to a great size, particularly those on the scapulæ, or back; in other parts, however, they seldom much exceed the size of a common hen's egg. They generally make their appearance about the second or third day, and for the most part after the protrusion of true buboes or carbuncles. They generally suppurate, though less rapidly than the true buboes.

Next to buboes, it appears, from Dr. Wilson's account, that carbuncles are the most remarkable of the pestilential eruptions. See Carbuncle.

BU'BON, macedonian parsley: a genus of the digynia order, belonging to the pentandria class of plants; and in the natural method ranking under the 45th order, *Umbellatæ*. The fruit is ovated, striated, and villous. Botanists describe four species, but the following only afford substances used in medicine. These are: 1. The *bubon galbanum* or African ferula. This rises with an upright stalk to the height of eight or ten feet, which at bottom is woody, having a purplish bark covered with a whitish powder that comes off when handled. The upper part of the stalk is garnished with leaves at every joint, the foot-stalks half-embracing them at their base, and set with leaves like those of the lovage, but smaller, and of a grey colour: the top of the stalk is terminated by an umbel of yellow flowers; which are succeeded by oblong channeled seeds, which have a thin membrane or wing on their border. When any part of the plant is broken, there issues out a little thin milk of a cream colour, which has a strong scent of galbanum. 2. The *bubon gummiferum*, with a mock chervil

leaf, rises with a ligneous stalk about the same height; and is garnished with leaves at each joint, which branch out like the former; but the small leaves or lobes are narrow and indented like those of bastard-hemlock. The stalk is terminated by an umbel of small yellow flowers, which are succeeded by seeds like those of the former sort.—These plants are all propagated by seeds, and require the common culture of other exotic vegetables. The galbanum of the shops is procured from both these sorts. See GALBANUM.

BU'BON GA'LBANUM; the systematic name of the plant which affords the officinal galbanum. See BUBON and GALBANUM.

BU'BON MACEDO'NICUM; the systematic name of the plant which affords the *semen petroselini Macedonici* of the shops. See PETROSELINUM MACEDONICUM.

BUBONOCELE, (from βουβων, *the groin*, and κηλη, *a tumor*); that species of hernia which is formed by a protrusion of some of the abdominal bowels through the rings of the external oblique muscles. It is known by the general symptoms of hernia (see HERNIA), and by a soft and somewhat elastic swelling, beginning in the groin, and descending by degrees into the scrotum in men, and into the labia pudendi in women. When the hernia contains omentum only, the swelling is both more soft, compressible, and more unequal than when the gut alone is down; the scrotum becomes more oblong than in the intestinal hernia; and when the quantity of omentum is large, it is also much more weighty than a gut rupture of the same size; but frequently the tumor is composed of both gut and omentum, and then the distinguishing symptoms of each can never be so clearly marked.

A bubonocele may be confounded with certain other diseases; but is distinguished by the following marks which are present in these disorders, while the symptoms of hernia are absent: from a venereal bubo, by the presence of that incompressible hardness with which all such swellings are at first attended, and by the fluidity of matter which, in the suppurative state, is always observable: from hernia humoralis, or swelling of the testis, by the absence of the hardened and enlarged state of the testis and epidydimis, and likewise of the pain, the tumor of the testicle being remarkably heavy in proportion to the bulk, and the spermatic process being commonly free from the swelling. In the hernia humoralis also the intestines are unobstructed, and the general symptoms of hernia are wanting. From the hydrocele of the tunica vaginalis testis, by the tumor generally feeling more smooth to the touch than in hernia, by the swelling here beginning in the under part of the scrotum and ascending, by the spermatic cord being always free and distinct, and by a fluctuation being evident. From hydrocele of the spermatic cord, sometimes with much difficulty, and therefore it requires here particular attention. In every case of tumor in the testes, where the most perfect certainty is not obtained, and when it is necessary to have recourse to an operation, the surgeon ought to proceed as in a case of real hernia.

The treatment of bubonocele is the same with that which is advised in the treatment of hernia in general, only making allowance for the situation of the disease. In attempting the reduction by means of the hand, the pressure should be obliquely upwards and outwards, corresponding with the ring of the abdominal muscle. In performing the operation, the patient should be laid on a table, with his head and body almost horizontal, whilst at the same time his buttocks are somewhat elevated by pillows placed beneath them. The legs, hanging over the edge of the table, ought to be separated, so as to admit the operator between them; and should in that situation be firmly secured by an assistant on each side, who should take care to keep the thighs so far raised as to relax all the abdominal muscles. The parts being previously shaved, an incision must be made with a common round-edged scalpel through the skin and part of the cellular substance, beginning at least an inch above the superior end of the tumor, and continuing it down to between two and three inches below the ring.

Although, in by much the greatest proportion of hernial swellings, the spermatic vessels lie behind the protruded parts, yet on some occasions they have been found on the anterior part of the tumor; so that in order to avoid the risk of wounding them, as soon as the skin is divided, the remainder of the operation ought to be done in the most cautious manner, care being taken to avoid every large blood-vessel which makes its appearance. The ring must now be laid distinctly in view; a portion of the protruding sac must also be exposed; after which the director is to be introduced between the ring and the sac, placing the point of the instrument obliquely upwards and outwards. A blunt-pointed bistoury is now to be introduced into the groove of the director, and by it the ring is to be dilated till the point of the finger can be introduced. The director is now to be laid aside, and the finger used in place of it through the rest of the operation. After the operation is finished, the dressings are to be applied, and the whole secured by a T bandage, or suspensory bag, properly stuffed with cotton or lint.

The patient, on being carried to bed, should have a pillow under the buttocks, to elevate them a little above the rest of the body, and should be treated in the manner which has been already directed. As soon as the wound is firmly cicatized, a truss ought to be properly fitted and used through the rest of the person's life. Females are liable to this species of rupture as well as men: and as the opening in the

external oblique muscles is exceedingly similar in both sexes, the treatment of this species of hernia in females is very similar to what is found to answer in men. When clysters, blood-letting, and the other remedies formerly referred to, fail, the same operation of enlarging the opening in the tendon of the oblique muscle is here equally proper as in the other sex.

As modest women are apt to conceal disorders of this kind, they may frequently happen when the surgeon receives no information about them. Whenever, therefore, such symptoms of colic occur as give reason to suspect the existence of hernia, a particular examination ought always to be made, in order, if possible, to detect the cause of the mischief, from the removal of which alone a cure can be expected.

BU'CCA, the cheek, or side of the face; or that part composed of common integuments and muscles, which lies between the eye, temple, nose, and ear.

BUCCAL GLANDS, (*glandulæ buccales;* from *bucca*, the cheek); the small glands of the mouth, under the cheek, which assist in secreting saliva to supply that cavity.

BUCCACRA'TON, (βεκκακρατον, from *buccea*, or *bucella*, that is, a morsel of bread sopped in wine, which served in old time for a breakfast). Paracelsus calls by the name of *bucella*, the carneous excrescence of the polypus in the nose, because he supposes it to be a portion of flesh parting from the bucca, and insinuating itself into the nose.

BUCCE'LATON, (βεκκελατον), a purging medicine made up in the form of a loaf; consisting of scammony, &c. put into fermented flour, and, then baked in an oven.

BUCCINA'TOR MUSCULUS, (from βουκανον, *a trumpet;* the trumpeter's muscle. It is thus named because of its use in forcing the breath to sound the trumpet. It arises, tendinous and fleshy, from the lower jaw, as far back as the last dens molaris, and, fore-part of the root of the coronoid process; fleshy from the upper jaw, between the last dens molaris, and pterygoid process of the sphenoid bone, from the extremity of which it arises tendinous, being continued between both jaws to the constrictor pharyngis superior, with which it joins; from thence proceeding with straight fibres, and, adhering close to the membrane that lines the mouth, is inserted into the angle of the mouth, within the orbicularis oris. Its use is to draw the angle of the mouth backwards and outwards, and to contract its cavity, by pressing the cheek inwards, by which the food is thrust between the teeth.

BU'CCULA, a diminutive of *bucca*, the cheek; the fleshy part under the chin.

BUCELLA'TIO, a way of stopping the blood by applying lint upon the vein or artery.

BUCE'PHALON, RED-FRUITED. The plant so called is the *trophis Americana* Linn. Its fruit is a kind of rough red berry, which is eaten by the inhabitants of Jamaica, although its flavour is by no means pleasant to those who are unaccustomed to it.

BUCHNE'RA, a genus in Linnæus's botany. He enumerates nine species.

BUCI'DA, a genus in Linnæus's botany. There is but one species.

BUCK-BEAN. See Trifolium paludosum.

BUCK-THORN. See Spina cervina.

BUCK-WHEAT; the *polygonum fagopyrum* Linn. The grain of this plant constitutes the principal food of the inhabitants of Russia, Germany, and Switzerland. It is found to be exceedingly nutritious.

BUCK-WHEAT, EASTERN; the *polygonum divaricatum* Linn. The roots of this plant, reduced into a coarse meal, are the ordinary food of the Siberians. The mountain rats in those parts also live upon them, and are provident enough in the winter to lay up a large store, which the Siberians plunder them of, and convert to their own use.

BUD. See Gemma.

BUFONIA, bastard chickweed; a genus in Linnæus's botany. There is but one species.

BUFONITA, the toad-stone. This has been received not only among the list of native stones by the generality of authors, but even has held a place among the gems; though undoubtedly it is an extraneous fossil. There has been an idle opinion in the world, that it was found in the head of a toad; and that this animal voided it at the mouth, on being put upon a red cloth. The general colour of the bufonitæ is a deep dusky brown; but it varies greatly in this respect in several specimens, some of which are quite black, others of an extremely pale, simple brown, a chesnut colour, liver colour, black, grey, or whitish. The bufonitæ are usually found immersed in beds of stone; and so little doubt is there of what they have originally been, viz. the petrified teeth of the *lupus piscis*, or wolf-fish, that part of the jaw of the fish has sometimes been found with the teeth petrified in it. To the *bufonitæ* many medical virtues have been ascribed, but the present practice has rejected them.

BUGLE. See Prunella.

BUGLOSS. See Buglossum.

BUGLO'SSUM, (from βες, *an ox*, and γλωσσα, *a tongue*), the officinal bugloss, or alkanet. This plant, *anchusa foliis lanceolatis strigosis, spicis secundis imbricatis, calycibus quinquepartitis:* Hort. Kew. Class, *Pentandria.* Order, *Monogynia;* was formerly esteemed as a cordial in melancholic and hypochondriacal diseases. It is seldom used in modern practice, and then only as an aperient and refrigerant.

BU'GULA. See Consolida media.

BULBI'NA, a diminutive of bulbus, a bulb.

BULBOCA'STANUM, (from βολβος, *a bulb*,

and *κασ̓ανον, a chesnut)*; so called from its bulbous appearance; the EARTH-NUT, KIPPER-NUT, or PIG-NUT. This root is as large as a nutmeg, hard, tuberous, and whitish, sending out fibres from the bottom and sides; the lower leaves are winged, cut into several divisions of leaves, finer and smaller than those of saxifrage; the stalk is above a foot high, having one leaf about the middle, which is as fine and slender as fennel, having the like leaves at every division of the branches, on the tops of which grow thin umbels of small white flowers. It grows in sandy and gravelly places, and flowers in May. The root only is used: this is eaten raw or roasted. It is sweetish to the taste, and somewhat nourishing.

BULBOCA'VERNOSUS, a muscle so called, from its origin and insertion. See ACCELERATOR URINÆ.

BULBOCO'DIUM, hoop-petticoat narcissus, a species of *Narcissus*.

BULBOCO'DIUM, mountain-saffron, a genus in Linnæus's botany. He enumerates one species.

BULBOCO'DIUM, a species of *Ixia*. Tournefort calls the *Ixia* thus.

BU'LBONACH, sattin, or HONESTY. The root is knotted, whence the name *Bulbonach*.

BULBO'SÆ, (from *bulbus*, a bulb); the name of the ninth class in Cæsalpinus's Method. This consists of herbaceous plants that have a bulbous root, and a pericarpium or seed-vessel, divided into three cells. See BULBUS. The lily, tulip, and onion, furnish examples. The names of *bulbosæ*, and *bulbosis affines*, are likewise given to the twenty-fourth and twenty-fifth classes in Ray's Methodus Propria, published in the Philosophia Botanica, p. 21.

BU'LBUS, a BULB; a kind of large bud, generally produced under the ground, upon or near the root of certain herbaceous plants, hence denominated *bulbous*. A bulb is described by Linnæus to be a species of hybernaculum, produced upon the descending caudex or root; consisting of stipulæ, petioli, the rudiments of the former leaves, and scales or bark. Trees which are perennial, with a woody and durable stem or trunk, have generally proper buds or gemmæ, but no bulbs.

In bulbous plants, as the tulip, onion, or lily, what we generally call the root, is in fact a bulb or hybernaculum, which incloses and secures the embryo or future shoot. At the lower part of this bulb, may be observed a fleshy knob or tubercle, from whence proceed a number of fibres or threads. This knob, with the fibres attached to and hanging from it, is, properly speaking, the true root; the upper part being only the cradle or nursery of the future stem, which, after the bulb has repaired a certain number of times, it perishes; but not till it has produced at its sides a number of smaller bulbs or suckers for perpetuating the species.

In bulbous roots, where the stalks and former leaves of the plant are sunk below, and formed into what is called the *bulb*, or wintering of the future vegetable, the radicles or small fibres that hang from the bulb are to be considered as the root; that is, the part which furnishes nourishment to the plant: the several rinds and shells whereof the bulb chiefly consists successively perish, and shrink up into so many dry skins; betwixt which, and in their centre, are formed other leaves and shells; and thus the bulb is perpetuated.

All bulbous roots, says Dr. Grew, in his Anatomy of Plants, may be considered as hermaphrodite roots, or root and trunk both together: for the radicles or fibres only are absolute roots; the bulb actually containing those parts which, springing up, make the body or leaves of the plant; so that it may be regarded as a large bud under ground.

Bulbous roots are said to be solid, when composed of one uniform lump of matter; tunicated, when formed of multitudes of coats surrounding one another; squamose, when composed of, or covered with, lesser flakes; duplicate, when there are only two to each plant; and aggregate, when there is such a congeries of such roots to each plant. See BOTANY, and Plate XI.

BULGE-WATER-TREE; the English name of the plant from which we obtain the cortex Geoffroyæ Jamaicensis. See ANTHELMINTICS, and CORTEX GEOFFROYÆ JAMAICENSIS.

BULI'MIA, *(βελιμια*, from *βε, a particle of excess*, and *λιμος, hunger)*, called by Vogel, bulimus, addophagia, cynorexia; *insatiable hunger*, or CANINE APPETITE.

This disease is commonly owing to some fault in the stomach, by which the aliments are thrown out too soon; and, unless the person be indulged in his desire for eating, he frequently falls into fainting fits. Sometimes it is attended with such a state of the stomach, that the aliment is rejected by vomit almost immediately after being swallowed; after which the appetite for food returns as violent as ever. But there are many circumstances which seem to render it probable, that it more frequently arises from a morbid condition of the secreted fluid poured into the stomach, by means of which the aliment is dissolved. When the activity of this fluid is morbidly increased, it will both produce too sudden a solution of the solid aliment, and likewise operate as a powerful and peculiar stimulus to the stomach, giving an uneasy sensation, similar to that which takes place in natural hunger. Such things are proper for the cure as may enable the stomach to perform its office: chalybeates and other tonics will generally be proper. In some, bitters drunk in a morning have been useful; and frequently smoking tobacco has relieved others. Oil, fat meat, pork, opiates, and in short every thing which in a sound person would be most apt to pall the appe-

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tite, may also be used as temporary expedients, but cannot be expected to perform a cure. In some, the pylorus has been found too large; in which case, the disease must have been incurable.

Dr. Lettsom communicated to the Medical Society of London, the history of a case of canine appetite, with vomiting, in which *three hundred and seventy-nine pounds of solid and fluid aliment* were taken into the stomach in the space of *six days.* The case fell under the notice of Mr. Wastell, a surgeon, in London. With this immense quantity of nourishment, which was always taken voraciously, and soon after ejected, the patient became emaciated. The recovery was effected by giving food, boiled down to a jelly, in small quantities, frequently repeated; by which means the tone of the stomach was gradually restored, and at length common aliment retained.

But, in the Medical and Physical Journal, a much more extraordinary account is given of a man who lived upon large quantities of raw flesh. The facts are communicated in a letter from Dr. Johnston, a commissioner of sick and wounded seamen, to Dr. Blane. This gormandizer is named Charles Domery, a native of Benche, on the frontiers of Poland, aged twenty-one. He was a prisoner of war, and brought to the prison of Liverpool, in 1799, having been a soldier in the French service on board the Hoche, captured by the squadron under the command of Sir John Borlase Warren, off Ireland. He is one of nine brothers, who, with their father, have been remarkable for the voraciousness of their appetites. They were all placed early in the army; and the peculiar craving for food with this young man began at thirteen years of age.

He was allowed two rations in the army, and by his earnings, or the indulgence of his comrades, procured an additional supply. The account of his devouring raw, and even alive, cats, rats, &c. besides bullocks' liver, tallow candles, and the entrails of animals, in great quantity, and with a truly bestial voracity, is too disgusting to repeat. We shall therefore confine ourselves to the following relation of the experiment made in confirmation of these extraordinary facts.

"Wishing fairly," says the reporter, Dr. Cochrane, "to try how much he actually could eat in one day: on the seventh of September, 1799, at four o'clock in the morning, he breakfasted on four pounds of raw cow's udder. At half past nine, in presence of Dr. Johnston, commissioner of sick and wounded seamen, Admiral Child and his sons, Mr. Foster, agent for prisoners, and several respectable gentlemen, he exhibited his powers as follows: there were set before him five pounds of raw beef, and twelve tallow candles of a pound weight, and one bottle of porter; these he finished by half past ten o'clock. At one o'clock, there was again put before him, five pounds of beef, and one pound of candles, with three bottles of porter; at which time he was locked up in the room, and sentries placed at the windows to prevent his throwing away any of his provisions. At two o'clock, when I again saw him with two friends, he had nearly finished the whole of the candles, and great part of the beef, but had neither evacuation by vomiting, stool, nor urine; his skin was cool, and pulse regular, and he in good spirits. At a quarter past six, when he was to be returned to his prison, he had devoured the whole, and declared he could have eat more; but from the prisoners without, telling him we wished to make some experiment on him, he began to be alarmed. It is also to be observed, that the day was hot, and not having his usual exercise in the yard, it may be presumed, he would have otherwise had a better appetite. On recapitulating the whole consumption of the day, it stands thus:

Raw cow's udder	4lb.
Raw beef	10
Candles	2
Total	16

besides five bottles of porter.

"The eagerness with which he attacks his beef when his stomach is not gorged, resembles the voracity of a hungry wolf, tearing off large morsels with his teeth, rolling them about in his mouth, and swallowing them with canine greediness. When his throat is dry from continued exercise, he lubricates it by stripping the grease off the candle between his teeth, which he generally finishes at three mouthfulls, and wrapping the wick like a ball, string and all, sends it after, at a swallow. He can, when no choice is left, make shift to dine on immense quantities of raw potatoes, or turnips; but, from choice, would never desire to taste bread or vegetables.

"He is in every respect healthy, his tongue clean, and his eyes lively.

"After he went to the prison, he danced, smoked his pipe, and drank a bottle of porter; and, by four next morning, he awoke with his usual ravenous appetite, which he quieted by a few pounds of raw beef.

"He is six feet three inches high, pale complexion, grey eyes, long brown hair, well made but thin, his countenance rather pleasant, and he is good-tempered."

To the above, which is attested by five respectable persons, besides Dr. Cochrane, the inspector and surgeon of the prisons, and agent for sick and wounded seamen, is added the following queries and answers:

"1. What is the quantity and quality of his fæces?

"He goes to stool commonly morning and afternoon, in a smaller or larger quantity, according to the victuals he eats; but the fæces are by no means proportioned to the *ingesta*, and, indeed, seldom exceeding those of other men. They are always of the same consistence, generally hard, but of no extraordinary colour; and this last is the same, whether he eats vegetables or not with his animal food. They are not particularly offensive.

"2. What are the circumstances of his sleep and perspiration?

"He goes to bed about eight o'clock at night, immediately after which he begins to sweat, and that so profusely, as to be obliged to throw off his shirt. He feels extremely hot, and in an hour or two after goes to sleep, which lasts until one in the morning; after which he always feels himself hungry, even though he had lain down with a full stomach. He then eats bread and beef, or whatever provision he may have reserved through the day; and, if he has none, he beguiles the time in smoking tobacco. About two o'clock he goes to sleep again, and awakes at five or six o'clock in the morning in a violent perspiration, with great heat. This quits him on getting up; and, when he has laid in a fresh cargo of raw meat (to use his own expression), he feels his body in a good state. The perspiration, whether sensible or insensible, has no remarkable smell; indeed, much less than that of many persons who live on a very different regimen. He sweats while he is eating; and it is probably owing to this constant propensity to exhalation from the surface of the body, that his skin is commonly found to be cool, as is stated in the narrative.

"3. What is his heat by the thermometer?

"I have often tried it, and found it to be of the standard temperature of the human body. His pulse is now eighty-four, full and regular.

"4. Can this ravenous appetite be traced higher than his father?

"He knows nothing of his ancestors beyond his father. When he left the country, eleven years ago, his father was alive, aged about fifty, a tall, stout man, always healthy; and he can remember he was a great eater, but was too young to recollect the quantity, but that he eat his meat half boiled. He does not recollect that either himself, or his brothers, had any ailment, excepting the small-pox, which ended favourably with them all. He was then an infant: his face is perfectly smooth.

"5. Does he make much urine?

"With his ordinary allowance of drink, not more than a quart in the day. He says, the smell is not more offensive than that of other men. On board of the transports, coming from Ireland, he drank his own urine as often as he voided it, for want of drink, and yet he never vomited it.

"6. Is his muscular strength greater or less than that of other men of his time of life?

"Though his muscles are pretty firm, I do not think they are so full or plump as those of most other men. He has, however, by his own declaration, carried a load of three hundred weight of flour in France, and marched 14 leagues in a day.

"7. Is he dull or intelligent.

"He can neither read nor write, but is very intelligent and conversable, and can give a distinct and consistent answer to any question put to him. I have put a variety at different times, and in different shapes, tending to throw all the light possible on his history, and never found that he varied, so that I am inclined to believe that he adheres to the truth.

"8. Under what circumstances did this voracious disposition first come on?

"It came on at the age of thirteen, as has been already stated. He was then in the service of Prussia, at the siege of Thionville: they were at that time much straitened for provisions, and, as he found this did not suit him, he deserted into the town. He was conducted to the French general, who presented him with a large melon, which he devoured, rind and all, and then an immense quantity and variety of other species of food, to the great entertainment of that officer and his suite. From that time he has preferred raw to dressed meat; and, when he eats a moderate quantity of what has been either roasted or boiled, he throws it up immediately. What is stated above, therefore, respecting his never vomiting, is not to be understood literally, but imports merely that those things which are most nauseous to others, had no effect upon his stomach.

"9. Is there any thing remarkable regarding his venereal appetite or powers?

"Upon inquiry, I do not find there is any thing remarkable in this man in these respects.

"There is nothing further to remark, but that, since the attested narrative was drawn up, he has repeatedly indulged himself in the cruel repasts there described, devouring the whole animal, except the skin, bones, and bowels; but this has been put a stop to, on account of the scandal which it justly excited.

"In considering this case, it seems to afford some matters for reflection, which are not only objects of considerable novelty and curiosity, but interesting and important, by throwing light on the process by which the food is digested and disposed of.

"Monstrosity and disease, whether in the structure of parts, or in the functions and appetites, illustrate particular points of the animal economy, by exhibiting them in certain relations in which they

are not met with in the common course of nature. The power of the stomach in so quickly dissolving, assimilating, and disposing of the aliment in ordinary cases, must strike every reflecting person with wonder; but the history of this case affords a more palpable proof, and more clear conception of these processes, just as objects of sight become more sensible and striking, when viewed by a magnifying glass, or when exhibited on a larger scale.

"The facts here set forth, tend also to place in a strong light, the great importance of the discharge by the skin, and to prove that it is by this outlet, more than by the bowels, that the recrementitious parts of the aliment are evacuated; that there is an admirable co-operation established between the skin and the stomach, by means of that consent of parts so observable, and so necessary, in the other functions of the animal economy; and that the purpose of the aliment is not merely to administer to the growth and repair of the body, but by its bulk and peculiar stimulus to maintain the play of the organs essential to life."

Another case of chronic dysphagia, which originated from a ravenous appetite, is published by Dr. Hagstrom, in the New Transactions of the Royal Academy of Sciences at Stockholm, vol. XIX. for 1798.

BULL, a species of the genus bos. See Bos. The flesh of this animal is described by Dr. Cullen as much more dense than that of the female of the same species, and therefore less proper for food. See Animal food, and Aliment.

BULLACE, a kind of plum, the produce of the *prunus insitia* Linn. which grows wild in our hedges. There are two varieties of these, the red and the white, which are used with the same intentions as the cammon damsons for food.

BU'LLA, a bubble, or vesicle; an clevation of the cuticle of a large size, irregularly circumscribed, and containing a transparent watery fluid. Clear vesicles from burns or scalds, are called by the old writers, *bullæ*. Vesicles, having a dark red, or livid-coloured base, are usually denominated *Phlyctenæ*. See Phlyctenæ.

BULLO'SA FEBRIS, (from *bulla*, a bubble), an epithet applied to the bullous or vesicular fever, from the appearance of the eruptions attending it. See Pemphigus.

BU'NIAS, or Bounias, (from βουνος, *a hill*, because it delights in rugged places); called also *actine* and *napus;* navew. It is a biennial plant of the turnip-kind, with oblong roots, growing slende from the top to the extremity. Linnæus supposes the two sorts; viz. the *wild* and the *sweet* navew, to be but varieties, and calls them by the name of *brassica radice caulescente fusiformi*. It is also the *napus sativa*, or *napus dulcis; rape*, *French navew*, *sweet navew*, and *French turnip*. It is the *brassica napus*, Linn. cultivated in gardens for the kitchen. These plants are warmer, and more grateful, than the common turnip, and afford a saccharine juice. The seeds of both sorts are warm and pungent, approaching to the virtues of mustard, but much inferior in their efficacy. Water takes up all their virtues. They yield by expression a large quantity of oil, which is sold under the name of *rape oil:* the wild sort is cultivated for this purpose. The cake remaining after the oil is expressed retains the acrimony of the seed.

BU'NIUM, pig-nut, or earth-nut, a genus in Linnæus's botany. He enumerates one species only. See Bulbocasta'num.

BUPHTHA'LMUM, ox-eye, a genus in Linnæus's botany. He enumcrates eleven species.

BUPHTHA'LMUS, (from βους, *an ox*, οφθαλμος, *oculus*, an eye), from its vast largeness like an ox's eye; a morbid enlargement of the eye-ball.

BUPLEU'RUM, hare's-ear, or, thorow-wax, a genus in Linnæus's botany. He enumerates seventeen species.

BUPLEU'RUM ROTUNDIFO'LIUM. The systematic name of the plant called *perfoliata* in the pharmacopœias. See Perfoliata.

BU'RGEON, in botany, a knot or button put forth by the branch of a tree in the spring. The word is formed from the French *bourgeon*, which signifies the same, formed from the latin *burrio*, of *burra*. Bourgeon amounts to the same with what is otherwise called eye, bud, or gemma. Frosts are chiefly dangerous when the burgeons begin to appear. The burgeons have the same skin, same pith, same ligneous body, and the same insertions as the stalk; that is, all the parts are the same in both, only more contracted in the former.

BURGOO, a kind of nutritive porridge, eaten by mariners, and much used in Scotland: it is made by gradually adding two quarts of water to one of oatmeal, so that the whole may mix smoothly; then boiling it for a quarter of an hour, stirring it constantly; after which, a little salt and butter should be added. This quantity, prepared as directed, will serve five or six persons for a meal; and Dr. Cockburn considers it very proper for correcting that unwholesome disposition to costiveness, so frequent to persons of a sea-faring life.

BURGUNDY PITCH; *pix burgundica*. The juice of the *pinus abies* Linn. (*Pinus foliis solitariis subtetragonis acutiusculis distichis*, *ramis infra nudis*, *conis cylindraceis*. Hort. Kew. Class, *Monœcia*. Order, *Monadelphia*), boiled in water, and strained through a linen cloth. It is chiefly employed for external uses in *inveterate coughs*, *affections of the lungs*, and *other internal complaints*. Plasters of this resin, by acting as topical stimulants, are frequently found of considerable service. In some cases it excites even vesications; but in general it produces only redness upon the parts to which it is applied, with a slight degree of moisture exuding from them.

BURHA'LAGA, a name for the plant called sea heath-spurge.

BURIAL, the interment of a deceased person. Among the primitive Christians, interment in cities was not permitted for the first three centuries, nor in churches for many ages after, and hereditary burying places were forbidden till the 12th century. That the practice of burying the dead within the walls of churches is highly pernicious, on account of the exhalations arising from the putrid bodies, must be evident to the meanest capacity. This absurd custom is of early origin: for the honour was at first conferred on the sacred relics of martyrs; and in the ninth century it was allowed also to persons of distinction: the same privilege was granted to those who revered the shrines—the clergy and monks making the faithful believe, that to place them in the repository of saints, was the greatest mark of dignity they could receive. Although this custom still prevails, yet, Dr. Willich asserts, that nothing can be more detrimental to the health of the living, even though the vaults should remain closed; because there is a continual putrid exhalation of noxious vapours, particularly in the hot days of summer. Hence this may be considered as the real cause of many disorders, which are erroneously attributed to the various, and often sudden, changes of the atmosphere.

With regard to *premature burial*, a circumstance which, in modern times, has excited the attention of many judicious inquirers, and even become the subject of public investigation, in several states of Europe, it is a well attested truth, that many unfortunate persons have been and probably still are, consigned to the grave, before they are actually dead; and that individuals, subject to epilepsy and apoplectic fits, have (horrid to relate!) been too hastily buried, or more properly *smothered* in their coffins. To prevent such fatal accidents, houses for the reception of dead bodies have, within these last ten years, been erected in various cities of Germany, where every inhabitant has a right to deposit the body of a deceased person, till putrefaction has actually commenced. We forbear to expatiate on the propriety and utility of a measure, which can be censured only by obstinate and superstitious Jews, who, from an old religious injunction, are enjoined to bury their departed friends on the same day, and before sun-set. For these last, and all other persons who from motives of conscience are in some degree compelled to subject their fellow creatures and dearest relatives to this dreadful risque, it would perhaps be desirable to preclude the *possibility of revival after interment*, by straining a tight cord round the neck of the corpse, or even by piercing the spinal marrow with an awl. And it seems in some degree incumbent on medical men who attend in such cases to promote this practice, rather than rely on the gradual extinction of incurable prejudices.

With respect to the method of ascertaining the probable causes, and most evident symptoms, of *actual dissolution*, we refer the reader to the article Resuscitation; and shall here only observe, that the *first* stage of putrescency may be distinguished by the oily nature of the humours exuding through the pores, and forming a perceptible clamminess on the surface of the body. The exhaling vapour is accompanied with a faintish or slightly cadaverous odour, which marks with precision the point of time for interment. In the *second* stage, the emanating vapour is sensibly alkalescent, with a strongly putrid and offensive smell, which may alone prove noxious to the attendants. On the contrary, in cases of cancer and mortification, the putrid effluvia proceeding from vital heat and motion, ceases after death, or as soon as the body becomes cold: hence the two cases are so distinct, that they cannot be easily mistaken.

BURMA'NNIA, a genus in Linnæus's botany. He enumerates two species.

BURNET SAXIFRAGE. See Pimpinella.

BURN, a wound or ulcer, produced by the destruction of a part of the body, in consequence of a dry heat applied to it. Where the injury is produced by a heated fluid, it is usually termed a scald; but the effects differ only in so far as the inferior degree of heat of which the fluid is capable, produces less violent effects, and leaves the part in a state of moisture, instead of converting it into a coal.

Burns are attended with a degree of inflammation, greater or less, according to the violence of the injury; and, according to the different appearances they put on, they may be divided into four different classes, 1. When the burnt part is affected only with a sense of heat and inflammation; 2. When it is also accompanied with intense pain and vesication; 3. When the integuments are converted into an eschar; and, 4. When all the soft parts are scorched to the very bone. These appearances are not to be produced by the same substance. Boiling water, for instance, though it will produce very intense pain, and destroy the skin, seldom produces any eschar. Boiling oil, pitch, resin, or wax, may produce a slight eschar, and always will blister the part. Linen, cotton, or other coverings of the body, when set on fire, will act with still greater intensity; but the most dreadful burns are those produced by melted or ignited metals, which, it is evident, may destroy not only the soft parts, but the bones also. A burn by any liquid substance is more severe when it happens through the medium of the clothes, than when it falls directly upon the naked skin, because thus the heat is applied for a considerable time without any diminution, or at least with very little, and therefore affects the parts to such a degree, that the skin almost constantly peels off with the clothes. Of this we have innumerable instances, when the legs

are scalded through the stockings with boiling water; and burns of this kind are constantly attended with very violent pain, inflammation, &c. In the mildest kind of burns with melted metals, or hot iron, the cuticle is scorched, and becomes white, yellow, or brown, according to the degree of injury. Sometimes the skin is entirely converted into a hard eschar, and then separates, as in any other case of mortification, leaving an ulcer more or less deep or wide, in proportion to the extent of the burn; but it is observable, that the pain attending injuries of this kind is much less when the skin is totally destroyed, than when it is not. The reason is, that thus the sentient extremities of the cutaneous nerves are scorched, and rendered insensible, and hence the pain of the burn must be very much diminished; while in those cases where vesications only are produced, the nerves remain most exquisitely sensible, and the most violent pain is felt by the patient.

In all accidents of this kind the patient's danger is exactly in proportion to the extent of the injury. Thus, for instance, where a person has unfortunately fallen into a large vessel of boiling water, wort, &c. none of the remedies which are found efficacious in cases of lesser burns, will here be of any use. The reason is, that in such violent injuries the greatest part of the cuticle is destroyed, and the excessive pain, irritation, and inflammation, excite such a violent degree of fever, that the patient generally expires in a short time. In some of those cases where the cuticle was almost entirely destroyed, the patient has expired in thirty-six or forty-hours, in a state of stupor or delirium. In very extensive burns, by hot metals, or by inflamed combustibles, a most alarming degree of mortification takes place, so that sometimes the patient is destroyed by it almost instantly; at others, he is wasted by the excessive discharge from the ulcer, and the effects of the air upon the surface of such a large sore; or, sometimes convulsions occur which prove fatal.

By chirurgical writers on the subject of burns, we have been told that the disease will be relieved by two very opposite means, viz. plunging the part into cold water, or else into very hot water; but how it can be remedied by the latter, which, perhaps, produced it, must appear a difficulty with those who have not sufficiently considered the subject. When a finger or other part of the body is slightly burned, it will be relieved, by holding it as near the fire as we can; and, on repeating this two or three times over, the pain, though very much increased on the first application, will gradually subside, and at last go off entirely. It is, therefore, on the same principle, we apprehend, that *hot* water (but by no means *boiling*, as some have ridiculously supposed) may possibly prove of service in slight cases, if the patient happen to have fortitude enough to make the experiment. The tone of the vessels is, in fact, restored by a degree of heat approaching, though still considerably inferior to, that which produced the injury; but, were we to expose it to the *very same degree*, it is impossible but we must be made worse by it. In like manner, if we happen to be scalded with boiling water, the tone of the parts will be restored, by putting it, for a short time, twice or thrice into a vessel of water fifty or sixty degrees colder than that which occasioned the injury, keeping the part some time immersed in it, by which the pain will soon be rendered very supportable, and at last go off altogether; and, though blisters may have taken place, no degree of secondary inflammation worth notice will occur.

Rum, brandy, or other ardent spirits, have been much recommended in burns; and the great degree of cold produced by their evaporation from the part certainly is in favour of their use; but, in order that the pain may be completely removed, it is necessary that their application should be continued for some time. The saturnine and other sedative lotions have been recommended, as in the cure of other inflammations; but a more effectual remedy than these, in cases of burns, either where the skin is quite sound, or where it is blistered, but the vesications not broken, is that of vinegar. Two or three folds of linen cloth dipped in it must be applied all over the burnt or scalded place; but if, by accident, any of the cuticle happens to be rubbed off, that part may be protected by a piece of linen cloth, exactly of the size of the sore, spread with the following cerate; covering the whole afterwards with the cloths dipped in vinegar, and these are to be moistened repeatedly without being removed, till both the pain and inflammation cease.

℞ Ceræ flavæ unc. iij.
Olei olivæ unc. viij.

These, after being slowly melted together, should be briskly stirred till quite cold.

Or the following, which, in some cases, is thought preferable:

℞ Ceræ albæ unc. ij.
Olei olivæ lib. fs.
Aceti distillati unc. ij.

After melting the two former ingredients together, the last is to be gradually incorporated by stirring.

Mr. Cleghorn, a brewer in Edinburgh, found this practice extremely useful, and was the first who recommended the application of vinegar to burns and scalds. After a time, if suppuration took place in any part, his custom was to sprinkle powdered chalk upon it to absorb the discharge,

and cover the whole with a common poultice, as we shall notice hereafter.

It is not a settled point among surgeons, whether the blisters which arise on burns ought to be opened, or not; but, if the former practice is preferred, the whole becomes like a blister made with Spanish flies, and when the cuticle happens to be rubbed off, which undoubtedly it must be, a very severe inflammation takes place, owing to the admission of the air to a sensible surface deprived of its natural covering; and, in such cases, it is by no means uncommon for the subsequent inflammation to spread beyond the limits of the original injury. Hence it is a common saying, that a burn spreads for nine days before it discovers the least inclination to heal; nay, some have been upwards of six weeks in healing, when they might easily have been cured in as many days, only by letting the vesications alone till the inflammation had subsided.

In very extensive burns, whilst these external applications are used, the patient ought to have a large dose of laudanum, by which the sense of pain will be abated, until the applications have had time to act. This ought to be repeated every six or eight hours, as occasion may require, and the cooling applications continued, until the inflammation be entirely gone, which in three or four days may be the case. But if, notwithstanding the above treatment, there is danger of a very severe inflammation taking place, blood-letting with the lancet is to be freely used, and cooling purgatives exhibited, as in other cases of inflammation Where the cuticle is rubbed off, the foregoing external applications may be resorted to.

In those formidable burns produced by metallic bodies, where the skin, and perhaps the cellular membrane, are converted into an eschar, we must have recourse to vinegar as already described, or as some surgeons advise, to a liniment composed of equal parts of olive-oil, or of cold-drawn linseed oil, and lime-water, which, by shaking, incorporate into a thick white substance, and generally give immediate ease. The best mode of applying this liniment is by means of a feather dipped in it, with which the surface of the burn is to be wholly rubbed over; after which, the sore must be covered with a piece of fine linen folded and dipped in the same, the application with the feather being renewed as often as the cloth appears to be dry. In cases of this kind, however, where large eschars are apt to slough off, and extensive and deep ulcers to be formed in consequence, we must prevent, as much as possible, the spreading of the suppuration farther than is absolutely necessary to throw off the parts that are totally destroyed. After these parts are thrown off, it will be proper to dress the sore in the same manner as in a scald of a simple kind.

Whenever fungous flesh arises in the ulcers which succeed burns, it may be removed, Mr. Latta asserts, by applying the following ointment:

℞ Alum. ust. pulver. subtil. ʒiss.
Axung. porcin. præp. ʒiij. Misce.

Pressure, however, by means of a compress and bandage, and dressing the wound with lint dipped in lime-water, decoction of bark, a solution of alum, or any astringent liquid, will do quite as well; or the part may be sprinkled daily with the *pulvis lapidis calaminaris cum myrrha* of the pharmacopœia chirurgica:

℞ Lap. calamin. præp.
Myrrhæ pulv. sing. unc. ss.
Misce fiat pulvis.

When burns are occasioned by the *explosion of gunpowder*, some of the grains of the powder are apt to be forced into the skin. At first they produce much irritation; and if they are not removed, they commonly leave marks which remain during life. Authors advise that they should, therefore, be picked out as soon as possible after the accident; and to prevent inflammation, as well as to dissolve any powder which may remain, the parts affected should be covered, for a day or two, with emollient poultices. In other respects, injuries of this sort are to be treated like any other kind of burns. When burnt parts are contiguous to each other, they are apt to adhere. To prevent this, pledgets, covered with any proper dressing, ought to be inserted between them during the course of the cure.

Thus far we have detailed, briefly, the *common practice of the day* respecting *burns;* but considerable light has, of late, been thrown upon the subject, by the writings of Sir James Earle, and by Mr. Kentish, a surgeon of Newcastle. As the principles and plan of treatment severally adopted by those gentlemen, are, to say the least, *essentially different*, we think it necessary to consider the subject at some length. The means recommended by Sir James Earle, consist in the speedy application of *cold water*, or *water cooled by ice*, which is to be renewed as often as it becomes warm. The cuticle of the burnt or scalded part is not to be removed; and all stimulant and oily applications are to be avoided. By these means, he says, the cure will be accomplished without leaving scars or lameness of the part; and he relates several cases which seem to be decisive of the propriety of this plan of treatment.

On the other hand, Mr. Kentish, of Newcastle, has combated in a very able manner the treatment of burns by cold applications, and, *from experience*, recommends a treatment diametrically opposite. His theory is, that, as a part burnt (when not ac-

tually destroyed) is in a high degree of excitement from the action of the most powerful stimulus in nature, that excitement is to be *gradually reduced by the use of less powerful stimuli*, till the part is brought to a healthy standard; just as, when, from the operation of cold, a part has become frost-bitten, its restoration depends, not on a great and sudden addition of stimulus, but on small degrees gradually applied. Hence, in reference to burns, in place of ice, venesection, &c. he uses ardent spirits, oil of turpentine, &c. and these in a heated state (even when the cuticle is detached), to bathe the parts with, whilst a thin liniment is preparing of ointment of yellow resin and oil of turpentine. This, being spread upon linen rags, is applied once in twenty-four hours, always observing to prepare the new dressing before the old one is taken off. As the action of the diseased part diminishes, the exciting measures are to be diminished. Proof spirit, or tincture of opium made warm are now sufficient. About the third day, suppuration commences, when mild applications are necessary, such as the *cerat. e lapide calamin.* Mr. Kentish recommends the following:

℞ Unguent. ceræ alb. unc. j.
Flor. zinci scrup. j. Misce.

and he approves of the lime-water liniment afterwards to strengthen the skin.

The internal means, where required, depend on the intention "to restore the unity of action in the whole system as soon as possible." For this purpose æther, brandy, &c. are administered within the first eight to twelve hours; wine or ale subsequently; and tincture of opium about the third day. This proceeding, however, is only used where the burn is considerable; in less urgent cases, opium or wine may be employed in the first instance instead of the more direct and powerful stimuli.

If any part is dead, the sloughing may be assisted by a simple bread and linseed poultice. Attention at the same time must be paid to the principles on which the cure is attempted, sometimes exciting, sometimes depressing the system, so as to keep up an exact balance. As a part of this plan the diet is also to be regulated, for where it is too full, the consequence is a too copious suppuration from the wounds.

The cases are numerous which Mr. Kentish has adduced in support of this plan of treatment, which has been very generally adopted by practitioners. Of those "where some parts have their action increased, and others their action destroyed," the mode of treatment is thus described:

1. *The external treatment.*—"As I never saw a burn," says Mr. Kentish, "where the part was so completely destroyed as not to leave other parts where the action was only increased, I should strongly recommend the use of those means which would save the then living parts; this is of the first consequence; as for the dead parts, the application which is immediately applied to them is of very little consequence, for the throwing off these eschars depends upon a process of the system, which the immediate application to the dead part will in no way either retard or facilitate; but to place the contiguous parts in a state of health and strength, so as to perform their actions with vigour, will certainly facilitate the process, and relieve the system from greater efforts, and the patient from a tedious cure.

"The progress of those parts which have only been slightly injured, will lead us to form a judgment of the state of those which are further injured; for, if the curative indications take place soon, and proceed with vigour in the one, we may be assured all the other functions are performing their offices duly in the other. As soon as the skin which has had the cuticle detached from it begins to secrete pus, which is sometimes the case upon the second day, the parts adjoining an eschar begin the suppurative process; that is, they tumefy, and the absorbents detach the dead and living parts from each other, while the exhalant or secreting vessels form pus: thus the surface is restored to its former functions, that of a secreting and absorbing surface, and although the parts are not guarded in the manner nature meant, yet, when the natural surface of a part is destroyed, this *secretion* and *absorption* is necessary to the healing process, aud the quickness or slowness with which an ulcer heals principally depends upon the management of these states. I am now speaking of the most favourable cases: for, though in some subjects this process may begin in sixty hours, yet I have seen it retarded to the tenth day, and the patient recover; but, in general, I believe it will be found, that if it does not take place before that period, the erysipelatous inflammation is communicated by the absorbents, and the secreting vessels, having their action upon the surface suspended, the inactive parts become greater and greater, till at last the system, thrown into *despair* as it were, increases its action, so as to exhaust its powers; and the whole fabric sinks, from general debility and local symptoms of mortification. The eschar will begin to detach itself around the edges, and, when once the skin is separated, the other parts will follow according to their specific nature: if only the adipose and cellular membranes are affected, they will soon be absorbed, and leave the wound in a situation to granulate. During the process of sloughing, a cataplasm of milk and bread, from its softness, and as applying a grateful degree of the stimulus of heat, is perhaps, one of the best topical applications at this period: the eschar may be washed with a little camphrated spi-

rit, so cautiously as to avoid touching the living parts, by which means the offensiveness of the wound will be much less to the patient and the attendants. Should the process stop at any period, touching the part either with camphorated spirit, or essential oil of turpentine, will be a sufficient stimulus to produce a renewal of action. If the secretion of pus round the edges of the wound, from the application of the cataplasm, should be too great, they should be washed with a little tepid Goulard's water, and afterwads well dusted or covered with some flowers of zinc. A cataplasm made with Goulard's water is sometimes of very great use; but if the surface was large, or the wound deep, the absorption of this mineral solution is sometimes attended with danger; nay, I have sometimes seen bad effects from it in an ointment, which has induced me to give the preference to the flowers of zinc, or the *lapis calaminaris.* When the dead parts are come away, the wound must be treated in such a manner as to keep as exact a balance between the absorption and secretion as possible; sometimes gently exciting, at others repressing, so as to allow the system to repair itself, which all its efforts tend to; but, as much of this depends upon the internal means, we must now treat of that."

2. *The internal treatment.*—"From the opinion which has been already advanced, it will be natural to conclude, that the mode of treatment thus followed in cases of increased action, will be necessary to be pursued until those parts are restored to the system; we shall, therefore, refer the treatment in the first instance to that head, and shall now only add what will be necessary, after the unity of action has taken place with all the living parts, to throw off those that are dead, and the after-treatment to facilitate the cure. After the system has been excited to such increased action as to take up the action of the diseased part, it will not afterwards be necessary to continue it longer, although it must not be so quickly lowered as if there were no eschars. When the unity of action is restored, the next process will be the commencement of the suppurative, that is, the edges of the eschar will tumefy, be absorbed, and pus secreted. This process of the system requires strength, that is, according to the strength of the subject it goes on more or less favourably, therefore the internal means must be such as give strength, without increasing action. This is perhaps answered by what is called a strong nourishing diet, better than by any other means, at the same time diminishing the fermented liquors. The bark is, by some, supposed to possess the power of strengthening in a very considerable degree; it, therefore, may be given in decoction, or in powder mixed with milk: the latter mode seems to have the advantage, as it answers partly for food at the same time. An anodyne may be given at night, as rest contributes much to facilitate the process; for all the actions which are involuntary are less disturbed during sleep than at any other time, consequently better performed. This strengthening plan ought to be continued until the eschar has loosened around the edges, when it may be lessened by taking less animal food, but should not be totally desisted from until the wound is quite free from the dead parts; when, instead of giving much strengthening food to support the discharge, he ought to be put upon rather a strict diet than otherwise, by which means the discharge moderates, the granulations take a firm healthy aspect, fungus is prevented, and the cure will proceed with such a degree of quickness as to astonish the surgeon, should he have been accustomed to view the slow progress from the former methods of treatment."

In his second Essay, Mr. Kentish confesses he had been greatly at a loss for an adequate remedy to repress the growth of fungus, and to absorb the redundant secretion. In a case which was more than a year under treatment, various astringent and absorbent means were used, all of which were inadequate to produce a permanent good effect, and required frequent changes to complete the formation of tender and unseemly cicatrices. At length he found that *chalk*, as recommended by Mr. Cleghorn, if prepared as directed in the Dispensatory, and afterwards finely levigated, answered the purpose. "As soon as secretion takes place," says Mr. Kentish, "I begin the use of powdered chalk, heated to the temperature of the body, which is plentifully applied to the whole secreting surface, and afterwards covered with a plaster of cerate. In cases of eschars coming away, or while they are detaching themselves, I fill up the hollow made by their loss when separated, and fill up their furrow at their edges when loosening, with powdered chalk, covered with the plaster; and if the process be tedious, a poultice of bread and milk is applied over the plaster. In very severe and extensive accidents of this kind, I have used this method throughout the whole cure after the formation of pus, and have in *general* found it prevent the necessity of either astringent or caustic applications; nor, on the other hand, have I found it retard the cure, by repressing the necessary secretion."

This ingenious writer adds, in conclusion, that he cannot attribute the success he has met with wholly to the application of external means. The *treatment of the general system* bears a very great share, in his opinion; and that treatment is as extraordinary, and as contradictory to the old methods, as any other part of the practice. In a former essay, he mentioned a *full diet* as to be allowed with the stimulant method of cure, which

he supposed to have kept up the irritation of the system, and caused the immense continued discharge by the exposed surfaces of the wounds; and also that the system was disposed to take on the action of hectic, which continued even after the cure. A case, however, which he afterwards relates, confirmed what he before had conjectured; on the *ninth* day a *counter-irritation* took place, by means of a violent diarrhœa; the diseased action of the intestines suspended the too great secretion of the sores, and the surface became almost quite *dry*. Between this and its again secreting plentifully, there was a *point*, or an *equilibrium* of action, at which the skinning process was more rapid than ever happened before. This accident led him to profit by his experience in subsequent cases; in which he remarked the good effect produced by an *artificial counter-irritation with cathartics*, which very materially facilitated the process of *skinning* —a process over which art has, as yet, acquired very little influence. In the intervals of the use of cathartics, the diet was bland and nutritive, such as bread and milk night and morning, boiled meat with potatoes for dinner, and no fermented liquor."

BURNING, or Brenning, an ancient medical term denoting an infectious disease, got in the stews by conversing with lewd women, and supposed to be the same with what we now call the *venereal disease*. In a manuscript of the vocation of John Bale to the bishopric of Ossory, written by himself, he speaks of Dr. Hugh Weston, who was dean of Windsor in 1556, but deprived by Cardinal Pole for adultery, thus: "At this day is leacherous Weston, who is more practised in the arts of breech-burning, than all the whores of the stews. He not long ago brent a beggar of St. Botolph's parish."

BURNT HARTSHORN. See Cornu cervi ustum.

BURNT SPONGE. See Spongia usta.

BU'RSÆ MU'COSÆ, (from βυρσα, *a bag*), mucous bags, situated in the joints, and near to the principal tendons, in order that the liquor they secrete may moisten, lubricate, and contribute to their easy motion. These organs form a very curious part of our structure, and a perfect knowledge of them will frequently be found useful in practice. The tendons of the muscles, at the wrists and ankles, and in their course along the fingers and toes, are conducted in sheaths. Some anatomists, especially the learned Haller, have mistaken the nature of the *bursæ*, supposing them to be formed of cellular membrane, like that which covers the belly of the muscles; while the greater number of the later writers have contented themselves with repeating the description given by Albinus.

The *bursæ mucosæ* are only to be found in the extremities of the body; they are in all 140, thirty-three in each superior, and thirty-seven in each inferior extremity. Many of them are placed on the inner sides of the tendons, between these and the bones. Many others cover not only the inner but the outer sides of the tendons, or are interposed between the tendons and external parts, as well as between those and the bones. Some are situated between the tendons and external parts only or chiefly; some between contiguous tendons, or between the tendons and the ligaments of the joints. A few such sacs are interposed where the processes of bones play upon the ligaments, or where one bone plays upon another. Where two or more tendons are contiguous, and afterwards separate from each other, we generally find a common bursa divided into branches, with which it communicates; and a few bursæ of contiguous tendons communicate with each other.

Some bursæ, even in young and healthy children, communicate with the cavities of the joints; and in many old persons, Dr. Monro says, he observed such communications formed by use or worn by friction, although there had been no lameness nor pain experienced by these persons during their lives.

There is some little difference, in different persons, as to the manner in which contiguous sacs communicate with each other, or with the cavities of the joints: and, particularly, as Dr. Monro has observed, that a bursa as large as a hen's egg, which is placed behind the tendon of the extensors of the leg, in some persons has no communication with the cavity of the joint of the knee; but in the greater number of children, as well as adults, although there was the appearance of a *septum*, or the root of one, yet the opening was found to be large enough to allow one or two fingers to pass from the bursa into the joint.

We are at first sight struck with the resemblance which the structure of the bursæ bears to that of the capsular ligaments of the joints; and the more attentively we pursue the comparison, the more just and perfect their agreement will be found.

1. The internal membrane of the ligaments of the joints, like that of the bursæ, is thin and dense.

2. It is connected to the external ligaments by the common cellular substance.

3. Between it and the bones, layers of cartilage or the articular cartilages are interposed.

4. At the sides of the joint, where it is not subjected to violent pressure and friction, the adipose substance is connected with the cellular membrane.

5. Within the cavities of the joints we observe masses of fat projecting which are covered with similar blood-vessels, and with similar fimbriæ or fringes hanging from their edges.

6. In the knee we may observe the upper part of such a mass of fat, forming what has been called *the mucilaginous gland of the joint*; and the under

part of it projecting into the bursa, behind the ligament which ties the patella to the tibia.

7. The liquor which lubricates the bursæ has the same colour, consistence, and properties, as that of the joints; and both, as we have found by experiment, are affected in the same manner by heat, mineral acids, and ardent spirits.

8. In some places the bursæ constantly communicate with the cavities of the joints; in others they generally do so: from which we may infer a sameness of structure.

As the admission of air into the *bursæ mucosæ* is productive of the worst consequences, Dr. Monro employs many arguments which prove the absolute necessity, where any operation requires an opening into these cavities, of preventing, as much as possible, any admission of air; and the directions which he gives for conducting the operation so as to avoid this inconvenience are well worth the surgeon's attention.

Mr. Gooch has given a list of the *bursæ mucosæ*, which is greatly extended in the following Table by Dr. Hooper:

Bursæ Mucosæ, *in the head.*

1. *A bursa of the superior oblique muscle* of the eye, situated behind its trochlea in the orbit.

2. *The bursa of the digastricus*, situated in the internal surface of its tendon.

3. *A bursa of the circumflexus*, or tensor palati, situated between the hook-like process of the sphænoid bone and the tendon of that muscle.

4. *A bursa of the sterno-hyoideus muscle*, situated between the os hyoides and larynx.

About the shoulder joint.

1. *The external acromial bursa*, situated under the acromion, between the coracoid process, deltoid muscle, and capsular ligament.

2. *The internal acromial*, situated above the tendon of the infra-spinatus and teres major: it often communicates with the former.

3. *The coracoid bursa*, situated near the root of the coracoid process: it is sometimes double, and sometimes triple.

4. *The clavicular bursa*, found where the clavicle touches the coracoid process.

5. *The subclavian bursa*, between the tendon of the subclavicularis muscles and the first rib.

6. *The coraco-brachial*, placed between the common origin of this muscle and the biceps, and the capsular ligament.

7. *The bursa of the pectoralis major*, situated under the head of the humerus, between the internal surface of the tendon of that muscle and another bursa placed on the long head of the biceps.

8. *An external bursa of the teres major*, under the head of the os humeri, between it and the tendon of the teres major.

9. *An internal bursa of the teres major*, found within the muscle where the fibres of its tendon diverge.

10. *A bursa of the latissimus dorsi*, between the tendon of this muscle and the os humeri.

11. *The humero-bicipital bursa*, in the vagina of the tendon of the biceps.

Dr. Hooper observes, that there are other bursæ mucosæ about the humerus, but their situation is uncertain.

Near the elbow joint.

1. *The radio-bicipital*, situated between the tendon of the biceps, brachialis, and anterior tubercle of the radius.

2. *The cubito-radial*, between the tendon of the biceps, supinator brevis, and the ligament common to the radius and ulna.

3. *The anconeal bursa*, between the olecranon and tendon of the anconeus muscle.

4. *The capitulo-radial bursa*, between the tendon common to the extensor carpi radialis brevis and extensor communis digitorum, and round head of the radius. There are occasionally other bursæ, but as their situation varies, they are omitted.

About the inferior part of the fore-arm and hand.

On the inside of the wrist and hand.

1. A very *large bursa*, for the tendon of the flexor pollicis longus.

2. *Four short bursæ*, on the fore-part of the tendons of the flexor sublimis.

3. *A large bursa*, behind the tendon of the flexor pollicis longus, between it and the fore-part of the radius, capsular ligament of the wrist, and os trapezium.

4. *A large bursa*, behind the tendons of the flexor digitorum profundus and on the fore-part of the end of the radius, and fore-part of the capsular ligament of the wrist. In some subjects it communicates with the former.

5. *An oblong bursa*, between the tendon of the flexor carpi radialis and os trapezium.

6. *A very small bursa*, between the tendon of the flexor carpi ulnaris and os pisiforme.

On the back part of the wrist and hand.

7. *A bursa*, between the tendon of the abductor pollicis longus and the radius.

8. *A large bursa*, between the two extensores carpi radiales.

9. *Another* below it, common to the extensores carpi radiales.

10. *A bursa*, at the insertion of the tendon of the extensor carpi radialis.

11. *An oblong bursa*, for the tendon of the extensor pollicis longus, and which communicates with 9.

12. *A bursa*, for the tendon of the extensor pollicis longus, between it and the metacarpal bone of the thumb.

13. *A bursa*, between the tendons of the extensors of the fore, middle, and ring fingers.

14. *A bursa*, for the extensors of the little finger.

15. *A bursa*, between the tendon of the extensor carpi ulnaris and ligament of the wrist.

There are also bursæ mucosæ between the musculi lumbricales and interossei.

Near the hip joint.

On the fore-part of the joint.

1. The *ileo-puberal*, situated between the iliacus internus, psoas magnus, and the capsular ligament of the head of the femur.

2. *The pectineal*, between the tendon of the pectineus and the thigh-bone.

3. *A small bursa* of the gluteus medius muscle, situated between it and the great trochanter, before the insertion of the pyriformis.

4. *A bursa* of the gluteus minimus muscle, between its tendon and the great trochanter.

5. *The gluteo-fascial*, between the gluteus maximus and vastus externus.

On the posterior part of the hip joint.

6. *The tubero-ischiatic bursa*, situated between the obturator internus muscle, the posterior spine of the ischium, and its tuberosity.

7. *The obturatory bursa*, which is oblong, and found between the obturator internus and gemini muscles and the capsular ligament.

8. *A bursa of the semi-membranosus*, under its origin and the long head of the biceps femoris.

9. *The gluteo-trochanteral bursa*, situated between the tendon of the psoas muscle and the root of the great trochanter.

10. *Two gluteo-femoral bursæ*, situated between the tendon of the gluteus maximus and os femoris.

11. *A bursa of the quadratus femoris*, situated between it and the little trochanter.

12. *The iliac bursa*, situated between the tendon of the iliacus internus and the little trochanter.

Near the knee joint.

1. *The supra-genual*, which adheres to the tendons of the vastus and cruralis, and the fore-part of the thigh bone.

2. *The infra-genual bursa*, situated under the ligament of the patella: this often communicates with the above.

3. *The anterior genual*, placed between the tendon of the sartorius, gracilis, and semitendinosus, and the internal and lateral ligament of the knee.

4. *The posterior genual*, which is sometimes double, and is situated between the tendons of the semi-membranosus, the internal head of the gastrocnemius, the capsular ligament, and internal condyle.

5. *The popliteal*, conspicuous between the tendon of that muscle, the external condyle of the femur, the semilunar cartilage, and external condyle of the tibia.

6. *The bursa of the biceps cruris*, between the external part of the tendon, the biceps cruris, and the external lateral ligament of the knee.

In the foot.

On the back, side, and hind-part of the foot.

1. *A bursa of the tibialis anticus*, between its tendon, the lower part of the tibia, and capsular ligament of the ankle.

2. *A bursa*, between the tendon of the extensor pollicis pedis longus, the tibia, and capsular ligament of the ankle.

3. *A bursa of the extensor digitorum communis*, between its tendons, the tibia, and ligament of the ankle.

4. *A large bursa*, common to the tendons of the peronei muscles.

5. *A bursa of the peroneus brevis*, proper to its tendon.

6. *The calcaneal bursa*, between the tendo Achillis and os calcis.

In the sole of the foot.

1. *A. bursa for the tendon of the peroneus longus.*

2. *A bursa*, common to the tendon of the flexor pollicis pedis longus, and the tendon of the flexor digitorum pedis communis longus profundus.

3. *A bursa of the tibialis posticus*, between its tendon, the tibia, and astragalus.

4. *Five bursæ for the flexor tendons*, which begin a little above the first joint of each toe, and extend to the root of the third phalanx or insertion of the tendons.

BURSA'LIS MUSCULUS, so called from its resemblance to *bursa*, a purse. It is the muscle which Bartholine calls *marsupialis*, and Innes calls the OBTURATOR INTERNUS.

BU'RSERA, a genus in Linnæus's botany, of the monogynia order, belonging to the hexandria class of plants. The calyx is triphyllous; the corolla tripetalous; the capsule, carnous, trivalved, and monospermous. There is but one species, the gummifera, or gum elemi. This is frequent in woods in most of the Bahama islands, and grows

speedily to a great height and thickness. The bark is brown, and very like the birch of Britain. The wood is soft and useless, except when pieces of the limbs are put into the ground as fences, when it grows readily, and becomes a durable barrier. The leaves are pinnate, the middle rib five or six inches long, with the pinnæ set opposite to one another on footstalks half an inch long. It has yellow flowers, male and female on different trees. These are succeeded by purple-coloured berries bigger than large peas, hanging in clusters on a stalk of about five inches long, to which each berry is joined by a footstalk of half an inch long. The seed is hard, white, and of a triangular figure, inclosed within a thin capsule, which divides in three parts, and discharges the seed. The fruit, when cut, discharges a clear balsam or turpentine, formerly much esteemed in medicine. On wounding the bark, a thick milky liquor is obtained, which concretes into a resin nothing different from the *gum elemi* of the shops. Dr. Browne, and after him Linnæus, have, according to Dr. Wright, mistaken the bark of the roots of this plant, for the SIMAROUBA, which is a species of QUASSIA.

BUTCHER'S BROOM. See ROSCUS.

BUTIGA, an inflammation of the whole face, otherwise called *Gutta Rosacea.*

BUTOMUS, FLOWERING-RUSH; a genus in Linnæus's botany. He enumerates one species, the IRIS PALUSTRIS.

BUTTER, (*butyrum*, βȣτυρον, from βȣς, *a cow*, and τυρος, *coagulum* or *cream)*, a fat unctuous substance, prepared from milk by beating or churning. See MILK. It was late before the Greeks attained any notion of butter; their poets make no mention of it, and yet are frequently speaking of milk and cheese. The Romans used butter no otherwise than as a medicine, never as a food. The ancient Christians of Egypt burned butter in their lamps instead of oil; and in the Roman churches, it was anciently allowed, during Christmas time, to do the same, on account of the great consumption of it otherwise.

Butter is the fat, oily, and inflammable part of the milk. This kind of oil is naturally distributed through all the substance of the milk in very small particles, which are interposed betwixt the caseous and serous parts, amongst which it is suspended by a slight adhesion, but without being dissolved. It is in the same state in which oil is in emulsions: hence the same whiteness of milk with the latter; and hence, by rest, the oily parts separate from both these liquors to the surface, and form a cream. When butter is in the state of cream, its proper oily parts are not yet sufficiently concentrated to form an homogeneous mass. Whilst separated by the interposition of a large quantity of serous particles, the butter cannot be completely formed, but by pressing out these heterogeneous parts by means of continued percussion by the well-known operation of churning, it then becomes an uniform soft mass.

Fresh butter, which has undergone no change, has scarcely any smell; its taste is mild and agreeable, it melts with a weak heat, and none of its principles are disengaged by the heat of boiling water. These properties prove, that the oily part of butter is of the nature of mild oils obtained from many vegetable substances by expression. Butter is constantly used in food; but, to be wholesome, it must be very fresh and free from raucidity; neither should it be fried or burnt, otherwise it cannot fail of disordering the stomach. Some persons indeed have stomachs so delicate, that they are even affected with inconveniences by the use of fresh butter and milk; and this observation is also applicable to all kinds of oil, fat, chocolate, and in general to all similar matters.

Notwithstanding the popular conjecture that butter is unwholesome, the trade in it is very considerable. Some even compute 50,000 tons annually consumed in London, procured chiefly from within forty miles round the city. Fifty thousand firkins are said to be sent yearly from Cambridge and Suffolk alone; each firkin containing 56lbs. But no butter is esteemed equal to that which is made in the county of Essex, well known by the name of Epping butter.

Dr. Cullen says, butter, which is the oily part of milk, has precisely the same qualities as are to be found in the other expressed, or, as they are called, fat oils, whether taken from animals or vegetables; and the use of all of them, either as diet or medicine, is very similar. "The only question," says he, "that might particularly occur here is, whether the oily part of milk is most safely employed in the state of cream, when it is joined with some portion of the caseous and serous parts, or when it is more entirely separated from these in the state of butter? I cannot be positive in answering this question; but it appears to me, that a quantity of oil in the state of cream will be more easily digested than an equal quantity of the oily part in the state of butter. Some difference, however, in this matter may arise from the difference of stomachs more or less disposed to digest oils; and I have known persons who could digest cream better than they could butter. Another difference in this respect may also arise from the stomach being more or less disposed to acidity; for in the more acescent stomach, cream may be more offensive than butter."

The Dr. speaks, in another place, of an instance of a laxative effect on the bowels, produced by taking daily, as a medicine, four ounces of butter. The patient constantly had a stool or two more than usual whenever he took this quantity of butter for the purpose.

BUTTER-BUR. See PETASITES.

BUTTER-FLOWER. See Ranunculus.

BUTTER-MILK, that part of milk which remains after the butter is extracted. Curds of butter milk are made by pouring into it a quantity of hot new milk. The quality of butter-milk greatly depends on the manner of managing the process of churning. If it be obtained according to the Lancashire method, it becomes an article of food that is both wholesome and pleasant; though it is, in many English counties, given to hogs. This method of preparing milk for butter, is as follows: The whole milk is divided into two parts; the first drawn being set apart for family use, after being skimmed; the cream of which is put into proper vessels, as also the whole of the second or last drawn milk, provincially called *afterings*. These two, being mixed together, are stirred, but not to a great depth, to prevent the supposed effects of air accumulating on the surface, and kept, according to the season of the year, exposed to the fire, for promoting the acetous fermentation, which is accelerated by the acid remaining in the vessels employed. For this reason they are not scalded, except after having contracted some taint; and, in this case, they are sometimes very expeditiously rinsed out with sour butter-milk: during this preparation for souring, the milk is kept ready for the churn; and in consequence of such treatment, not only more butter is obtained, and of a better quality, than if the milk were churned in a sweet state, but the butter-milk is of a much superior quality.

Good butter-milk is refreshing and nutritive: hence it is often recommended in hectic fevers, for abating preternatural heat and flushings of the face, as well as to support the constitution. In spring, if drank freely, it is said to produce a favourable change on the fluids, when they are in a state of acrimony. And, though modern physicians justly smile at the idea of sweetening, or purifying, the blood, yet the good effects of butter-milk, as well as sweet whey, in proper cases and constitutions, have too often been experienced to admit of any doubt, in consequence of an unsettled theory. To this indeed, Dr. Cullen bears testimony in the following terms:

"Butter-milk," says he, "is commonly procured from milk after it has been kept for some time, and has become more or less acid: but it may be procured from very recent milk; and in this case the butter-milk is not acid, and only differs from entire milk by the oily part being taken away. In this state it is still tolerably nourishing; and being often more easily digested than entire milk, I have often employed it in phthisical cases with more advantage than I could do either the entire milk or the watery parts of it in a more acid state. It is in this last state, however, that it is most commonly employed; and it is highly useful in all cases where the refrigerant powers of milk are required. As the longer it has been kept it seems to have its acidity increased, so it proves more powerfully refrigerant. Some have imagined that in certain cases it might be dangerous: but unless when drank in very large quantity, or when the body is very warm, I have not perceived its bad effects; and in the last case, it is probable that cold water would have done the same mischief. With respect to the acid of butter-milk, or other acid states of the watery part of milk, it is worth observing, that such acid does not increase the acescency of the stomach, or occasion the flatulency that recent vegetable acids and acescents commonly do; and therefore it is more safely than these employed in dyspeptic persons."

BUTTERWORT. See Pinguicula.

BU'TUA. See Pariera brava.

BUTY'RUM ANTIMONII. See Antimonium muriatum.

BUXTON WATERS, warm mineral springs which rise in the village of Buxton, in Derbyshire. These have long been celebrated for their medicinal properties. One of the earliest treatises on the virtues of this spring, was published in the year 1752, by Dr. Jones, of Derby; at which period Buxton appears to have been a place of great resort. Dr. Short, in his *history of Mineral Waters*, mentions that several remains of Roman antiquities have been discovered near this spot, hence it is probable that the fountain was known to the ancients.

The springs issue from several small fissures, in a calcareous free-stone. They are very numerous, and always afford a sufficient quantity of water to supply the various baths. The most ancient spring is called St. Anne's Well, which is now inclosed in an elegant stone building. There are several others, that supply a number of beautiful baths, both public and private.

With respect to its sensible properties, the Buxton water cannot be distinguished from common spring water, when heated to the same temperature. It is clear and colourless, and does not become turbid on being exposed to the air; it leaves no sediment, nor does it form any incrustation on the pipes, or stones, through which it flows. Its temperature in the gentlemen's bath is invariably at 82°. During the cool of the morning and evening, a thin column of steam is perceptible over the surface of the bath; but, if this continues throughout the day, it is considered as an indication of approaching rain. The principal peculiarity in the appearance of this spring, is a large quantity of elastic vapour that rises, and forms bubbles, which pass through the water, and break as soon as they reach the surface. The air of these bubbles was ascertained by Dr. Pearson, to consist of azotic gas, mixed with a small proportion of atmospheric air. By evaporation to dryness, he found that a gallon of the water contained only 15 grains of re-

siduum, of which he estimated $1\frac{3}{4}$ grains to be muriat of soda, $2\frac{1}{2}$ sulphat of lime, and $10\frac{1}{2}$ carbonat of lime.

Buxton water is frequently employed both internally and externally; one of which methods often proves beneficial, when the other would be injurious; but as a bath alone, Dr. Willich says, its virtues may not be superior to those of common water. As the temperature of 82°. is several degrees below that of the human body, a slight shock of cold is felt on the first immersion into the bath; but this is almost immediately succeeded by a pleasing glow over the whole system. It is, therefore, proper for very delicate and irritable habits.

The cases which derive most benefit from the external use of Buxton waters, are those in which a loss of action, and sometimes of sensation, affects particular limbs; in consequence of long-continued or violent inflammation, or external injury. Hence, the chronic rheumatism, succeeding the acute, and where the inflammation has been seated in particular limbs, is often wonderfully relieved by this bath. The internal use of the water has been found to be of considerable service in symptoms of defective digestion and derangement of the alimentary organs. A judicious use of this simple remedy will often relieve the heart-burn, flatulency, and sickness; it will increase the appetite, animate the spirits, and improve the health. At first, however, it sometimes occasions a diarrhœa, which is rather salutary than detrimental. It also affords great relief, when taken internally, in painful disorders of the bladders and kidneys; and has likewise been recommended in cases of the gout; but, when taken for these complaints, Dr. Denman advises the addition of some aromatic tincture.

As an external application in the gout, Buxton water is sometimes of service, though the bath itself is more likely to restore the functions of the parts afflicted with this disease. In all cases of active inflammation, the use of these waters should be carefully avoided, on account of their supposed heating properties. A full course consists of two glasses, each containing one-third of a pint, before breakfast; which quantity should be repeated between breakfast and dinner. It is seldom administered as a medicine in the evening; but, as the inhabitants of the place use it for their common drink, and also for most of their domestic and culinary purposes, the invalid is apt to take a much greater quantity than is prescribed, and thus to defeat the purpose. In chronic cases, a long residence on the spot is requisite, to ensure the desired effect.

In the year 1773, a treatise on the virtues of these waters was written by the late Dr. Percival, of Manchester; since which period several pamphlets have appeared on the subject; namely, those of Drs. Denman, Higgins, and Pearson; and more recently, an account of these waters has been given, in a treatise on mineral waters, by Dr. Saunders, of London.

BU'XUS, (πυξος; from πυκαζω, *to become hard*). The leaves of the box-tree, *Buxus sempervirens* of Linnæus, possess a very strong, nauseous, bitter taste, and aperient virtues. They are occasionally exhibited in form of decoction amongst the lower orders of people, in cases of dropsy and asthma. Its effects are said greatly to resemble those of a decoction of guaiacum, being powerfully sudorific.

BU'XUS SEMPERVI'RENS; the systematic name of the *buxus* of the pharmacopœias. See BUXUS.

BUYO-BUYO, a sort of pepper in the Philippine islands. Ray calls it *Piper Longum Monardi.*

BYNG, a Chinese name for green-tea.

BY'SSUS, in botany; a genus of the fifty-seventh natural order, viz. *Algæ*, belonging to the cryptogamia class of plants. It has a down, or very fine uniform powder.. The character is taken from this circumstance, that they are covered with a simple capillary filament or down, resembling soft dust. There are fifteen species, all natives of Britain, growing upon rotten wood, old walls, &c. The name of BYSSUS, or *byssum*, has also been given to a fine thready matter produced in India, Egypt, and about Elis in Achaia, of which the richest apparel was anciently made.

BYSSUS ASBESTINUS, a species of ASBESTOS, composed of fine flexible fibres, parallel to one another. It is found plentifully in Sweden.

BYTTNE'RIA, a genus in Linnæus's botany. He enumerates three species.

C

CAACI'CA BRASILIE'NSIS; a plant growing in Brasil, which resembles the male speedwell. It contains a milky juice. When fresh, it is bruised, and applied against venomous bites.

CAA'CO; the name of a species of sensitive plant, whose root is used by the natives of America as an antidote to several poisons.

CAAETIMA'RY; the *senecio Brasiliensis.* A

decoction of the plant thus called is used as a lotion to cure the itch.

CAAMI'NI, a name given by the Spaniards and others to the finest sort of Paraguayan tea. It is the leaf of a shrub which grows on the mountains of Maracaya, and is used in Chili and Peru as tea is with us. The mountains where this shrub grows naturally are far from the inhabited parts of Paraguay; but the people of the place know so well the value and use of it, that they constantly furnish themselves with great quantities of it from the spot.

CABALLINE, denotes something belonging to horses: thus, caballine aloes is so called, from its being chiefly used for purging horses; and common brimstone has been called sulphur caballinum, for a like reason.

CAA-O'PIA; the name of a tree which grows in the Brasils. Its bark, when wounded, emits a juice, which, in a dried state, resembles gamboge, except that it is rather of a darker red colour.

CAARO'BA; the country name of a tree which grows in the Brasils. A decoction of its leaves promotes perspiration, and is given in the cure of venereal symptoms.

CABBAGE. See BRASSICA.

CABBAGE-BARK TREE. See the articles ANTHELMINTICS, and CORTEX GEOFFROYÆ JAMAICENSIS.

CACA'LIA; a genus in Linnæus's botany. He enumerates twenty-seven species.

CACALIA'NTHEMUM; a name given by Dillenius to a tree which was brought from the Canary islands, and which is also called the carnation tree, and the cabbage-tree.

CACATO'RIA FEBRIS; a name given by Sylvius to a kind of intermittent fever, attended with copious stools.

CACCIO'NDE; a pill commended by Baglivi against the dysentery: its basis is the *catechu*.

CACHE'XIA, (from κακος, *bad*, and εξις, *a habit)*; a bad habit of body, without pyrexia, and independent of any other disease. It constitutes the third class in Cullen's nosology, and has three orders, viz. *marcores*, *intumescentiæ*, and *impetigines*.

CACHU'NDE; a medicine highly celebrated among the Chinese and Indians, made of several aromatic ingredients, perfumes, medicinal earths, and precious stones. They make the whole into a stiff paste, and form out of it several figures according to their fancy, which are dried for use. These are principally used in the East Indies, but are sometimes brought over to Portugal. In China, the principal persons usually carry a small piece in their mouths, which is a continued cordial, and gives their breath a very sweet smell. It is highly esteemed as a medicine in nervous complaints; and is reckoned a prolonger of life, and a provocative to venery, the two great intentions of most of the medicines used in the East.

CACOCHY'MIA, (from κακος, *bad*, and χυμος, *humour)*; according to the humoral pathology, a vicious state of the vital fluids, especially of the mass of blood; supposed to arise either from a disorder of the secretions or excretions, or from external contagion.

CA'CHRYS, in Linnæus's botany, the name of a genus, of which he enumerates three species.

CA'CHRYS ODONTA'LGICA; a plant, the root of which may be substituted for that of the pyrethrum.

CACHY'MIA; a term in Paracelsus, by which he means an imperfect metallic body, or an immature metalline ore.

CA'COA NUT, or CACAO NUT; the nut of which chocolate is made. It is an oblong, roundish fruit, nearly of the shape of an almond, but larger; the shell dark coloured, brittle, and thin; the kernel, both externally and internally, brownish. It is the produce of a small tree, the *theobroma cacoa; foliis integerrimis* Linn. bearing a large red fruit, shaped like a cucumber, which contains thirty or more of the nuts. Cacoa is variously prepared for sale in the shops; has a light, agreeable smell, and an unctuous, roughish, but pleasant taste. Chocolate, by far the best of all its preparations, affords a nutritious and gently aperient dietetic fluid in consumptive diseases, emaciations, and various affections of the primæ viæ; though it is not always found to agree with the stomach.

CACO'ETHES, (κακοηθης, from κακος, *ill*, and ηθος, a word which, when applied to diseases, signifies a *quality*, or a *disposition)*. Hippocrates applied this word to malignant and obscure diseases. Galen, and some other old writers, express by it an incurable ulcer, that is rendered so through the acrimony of the humours flowing to it. Linnæus and Vogel use this term much in the same sense with Galen, and describe the ulcer as superficial, spreading, weeping, and having callous edges.

CA'CTOS, the plant named CHARDON.

CA'CTUS, the MELON THISTLE. It is a genus in Linnæus's botany. He adds to this genus, the *cereus*, or *torch thistle*, and *opuntia* or *Indian fig*. He enumerates twenty-four species.

CAC'TUS OPU'NTIA; the systematic name for the plant bearing the epithet *opuntia* in the pharmacopœias. See OPUNTIA.

CA'DDICE or CADDIS, a kind of soft lint, but something different from that which is made by scraping linen rag.

CADE OIL, in the *materia medica*, a name given to an oil much in use in some parts of France and Germany. The physicians have called it *oleum cadæ*, or *oleum de cada*. This is supposed by some

to be the *pisselæum* of the ancients, but improperly: it is made of the fruit of the oxycedrus, which is called by the people of those places *cada.*

CADU'CA, *(sc. membraná;* from *cado*, to fall down.) See DECIDUA.

CADU'CI, (from *cado*, to fall), in botany, the name of a class in Linnæus's Methodus Calycina. It consists of plants whose calyx is a simple perianthium, supporting a single flower, or fructification, and falling off either before or with the petals. It stands opposed to the classes *persistentes* in the same method, and is exemplified in *sinapi*, mustard; and in the *ranunculus.*

The term caducous is expressive of the shortest period of duration, and has different acceptations, according to the different parts of the plant to which it is applied. Thus, a calyx is said to be caducous, which drops at the first opening of the petals, or even before, as in the poppy. Petals are caducous, which are scarcely unfolded before they fall off, as in meadow-rue; and such leaves have obtained this denomination as fall before the summer ends.

Hence, it evidently appears, that the above mentioned class in Linnæus's Methodus Calycina, includes not only such plants as have a caducous calyx, properly so called, but those also in which the calyx falls off either before or with the petals. See the articles DECIDUUS and PERSISTENS.

CADU'CUS MORBUS. See EPILEPSIA.

CÆCI'TAS, (from *cæcus*, blind); blindness, deprivation or want of sight, which may arise from several causes. See CALIGO.

CÆCUM, (from *cæcus*, blind); the blind gut, so called from its being perforated at one end only. It is about four fingers breadth long. Winslow observes, that its diameter is more than double that of the small intestines. By its open end it is connected with the beginning of the colon, to which it seems to be an appendage, and from which it has nothing to distinguish it except being a little wider, shut at its under end, and giving off the *appendicula vermiformis.* It is remarkable too for this: that, whatever goes into it and returns, passes both ways by the same orifice.

CÆSALPI'NIA; a genus in Linnæus's botany. He enumerates three species. Father Plumier gave this name to a plant which he discovered in America, in honour of Andreas Cæsalpinus, an eminent botanist, and one of the first who attempted to class plants. See BOTANY, and CÆSALPINUS.

CÆSALPINUS (Andreas), an eminent philosopher and physician, was born at Arezzo, about 1159. After being long professor at Pisa, he became first physician to pope Clement VIII. It should seem, from a passage in his "Quæstiones Peripateticæ," that he had some idea of the circulation of the blood. "The lungs," says he, drawing the warm blood through a vein (the pulmonary artery) like the arteries, out of the right ventricle of the heart, and returning it by an anastomosis to the venal artery (the pulmonary vein) which goes to the left ventricle of the heart, the cool air being in the mean time let through the canals of the aspera arteria, which are extended along the venal artery, but do not communicate with it by inosculations, as Galen imagined, cools it only by touching. To this circulation of the blood out of the right ventricle of the heart through the lungs into its left ventricle, what appears upon dissection answers very well; for there are two vessels which end in the right ventricle, and two in the left; but one only carries the blood in, the other sends it out, the membranes being contrived for that purpose." His treatise "De plantis" entitles him to a place among the leading writers in botany (see BOTANY); for he there makes the distribution of plants into a regular method, formed on their natural similitude, as being the most safe and the most useful for helping the memory and discovering their virtues. Yet, which is very surprising, it was not followed, nor even understood, for near a hundred years. The restorer of method was Robert Morison, the first professor of botany at Oxford. Cæsalpinus died at Rome, Feb. 23, 1603. His "Hortus siccus," consisting of 768 dried specimens, pasted on 266 large pages, is still in being.

CÆSAREAN SECTION, or Cæsarian operation, so called because Julius Cæsar is said to have been extracted in this manner; the operation for extracting the fœtus from the uterus, by dividing the integuments of the abdomen and of the uterus. See HYSTEROTOMIA.

CÆSIA; a species of the MIMOSA.

CAINI'TO; an American name for the star-apple. In Linnæus's botany, it is the gold-coloured-leaved star apple-tree; which is a species of CHRYSOPHYLLUM.

CAI'RA; a name given by the natives of Bahar province to the MIMOSA JAPONICA.

CAI'JAN; American cytisus, or PIGEON-PEA; a species of CYTISUS.

CA'JEPUT OIL, *oleum cajeputæ*, or *oleum Wittnebianum.* The tree which affords this oil, by distillation of its leaves, is the *melaleuca leucadendron* Linn. of which there are two varieties, the *latifolia* and *angustifolia*, both natives of the woods of India. Thunberg says, cajeput oil has the appearance of inflammable spirit, is of a green colour, and so completely volatile, that it evaporates entirely, leaving no residuum: its odour is of the camphoraceous kind, with somewhat of a terebinthinate scent also. Goetz says, it is limpid, or rather yellowish. It is a very powerful medicine, and in high esteem, in India and Germany, in the character of a general remedy in chronic and painful diseases. It is used, in fact, for the same pur-

poses for which we employ æther, to which it seems to have a considerable affinity. The cajeput oil, however, is more potent and pungent: if taken into the stomach, in the dose of five or six drops, it heats and stimulates the whole system, proving at the same time a very certain diaphoretic, by which probably the good effects it is said to have produced in dropsies and intermitting fevers are to be explained. For its efficacy in various convulsive and spasmodic complaints, it is also highly esteemed. It has also been used, both internally and externally, with much advantage in several other obstinate disorders; as palsies, hypochondriacal and hysterical affections, deafness, defective vision, tooth-ach, rheumatism, &c. The dose is from two to six, ten, and even twelve drops.

CALABASH, a light kind of vessel formed of the shell of a gourd, emptied and dried, serving to deposit different kinds of goods in, as resin, aloes, and the like. The word is Spanish, *calabacca*, which signifies the same. The Indians, both of the North and South Seas, use calabashes, and also the negroes on the coast of Africa.

CALAGUA'LA, or *calaguelæ radix*. The root so called is knotty, and somewhat like that of the polypody tribe. It has been exhibited internally at Rome, with advantage, in dropsy; and it is said to be efficacious in pleurisy, contusions, abscesses, &c. It was first used in America, where it is obtained; and the Italian physicians have since written concerning it in terms of approbation.

CALAMA'CORUS; the INDIAN REED.

CALAMAGRO'STIS, branched REED-GRASS; a species of ARUNDO. A species of AGROSTIS is also called *calamagrostis*.

CALAMA'RIÆ, (from *calamus*, a reed); the name of the third order in Linnæus's Fragments of a Natural Method. This order will be easily distinguished from the family of the grasses, to which it is nearly allied, by observing: 1. That the base of the leaf, which embraces the stalk like a glove, has no longitudinal aperture in plants of this order, but is perfectly entire. 2. That the stalk is generally triangular, and without knots, or joints. 3. That the flowers have no petals. The following genera are contained in this natural order: viz.

Hermaphrodite plants.—*Cyperus*, cypress grass; *Eriophorum*, cotton grass; *schœnus*, bastard cypress; *scirpus*, rush grass.

Androgynous plants, (Monœcia).—*Carex*; *sparganium*, burr-reed; *typha*, cat's-tail, or reed-mace.

In Linnæus's former editions of the *Fragmenta*, the genera *bobartia*, *flagellaria*, and *juncus*, made part of this order: they are now removed into the order TRIPETALOIDEÆ, which see.

CALAME'DON, (καλαμηδον, from καλαμος, *a reed*); a name given by the old Latin writers to a species of fracture which runs along the bone in a right line, but is lunated in the extremity.

CALAMINE, LAPIS CALAMINARIS, or *cadmia fossilis*, a sort of stone or mineral, containing zinc, united with a portion of iron, and sometimes other substances. It is considerably heavy, and the more so the better; moderately hard and brittle, or of a consistence betwixt stone and earth: the colour is sometimes whitish or grey; sometimes yellowish, or of a deep yellow; sometimes red; sometimes brown or blackish. It is plentiful in several parts of Europe, as Hungary, Transylvania, Poland, Spain, Sweden, Bohemia, Saxony, Goslar, France, and England, particularly in Derbyshire, Gloucestershire, Nottinghamshire, and Somersetshire, as also in Wales. The calamine of England, however, is, by the best judges, allowed to be superior in quality to that of most other countries. It seldom lies very deep, being chiefly found in clayey grounds near the surface. In some places it is mixed with lead ores. Calamine is the only true ore of zinc, and is used as an ingredient in making of brass. The chemists have related various experiments, calculated to show that it contains iron, as we have already said. This mineral is an article in the materia medica; but, before it comes to the shops, it is usually roasted or calcined, in order to separate some arsenical or sulphureous particles, which, in its crude state, it is supposed to contain, and also to render it more easily reducible into a fine powder. In this state, it is employed in collyria for weak eyes, for promoting the cicatrization of ulcers, and healing excoriations of the skin. It is the basis of an officinal cerate called, in the revised editions of the college pharmacopœias,

Ceratum Lapidis Calaminaris. Lond.

Take of Olive oil, one pint;
Yellow wax,
Calamine prepared, of each half a pound.

Liquefy the wax with the oil, expose it to the air, and, as soon as the mixture begins to grow stiff, sprinkle in the calamine; keeping them constantly stirring together, till the cerate be quite cold.

Ceratum Carbonis Zinci Impuri. Edin.

Take of Simple cerate, five parts;
Calamine prepared, one part.

Mix them as in the former case.

These compositions form the cerate which Turner strongly recommends for healing ulceratious and excoriations, and which have been popularly distinguished by his name. They appear from experience to be excellent epulotics, and are very commonly used in practice.

The collyria in which the prepared calamine has been employed, have consisted simply of that sub-

stance added to rose-water, or elder-flower water; but a more elegant and effectual formula is that in which the *flowers of zinc* are used. See ZINC. Though lapis calaminaris be the only native ore of zinc, there is another substance from which that semi-metal is also obtained. This is called *cadmia fornacum*, or *cadmia of the furnaces*, to distinguish it from the other. This is a matter sublimed when ores containing zinc, like those of Rammelsberg, are smelted. This cadmia consists of the flowers of the semi-metal sublimed during the fusion, and adhering to the inner surface of the walls of furnaces, where they suffer a semi-fusion, and therefore acquire some solidity. So great a quantity of these are collected, that they form very thick incrustations, which must be frequently taken off. The name of cadmia of the furnaces has also been given to all the soots and metallic sublimates formed by smelting, although there is a material difference in them.

CALAMINT, COMMON. See CALAMINTHA.

CALAMINT, MOUNTAIN. See BALAMINTHA MAGNO FLORE.

CALAMI'NTHA, (καλαμινθη, from καλος, *beautiful*, or καλαμος, *a reed*, and μινθη, *mint)*; common CALAMINT. It is the *melissa calamintha; pedunculis axillaribus*, *dichotomis*, *longitudine foliorum* Linn. This plant smells strongly, like wild mint, though more agreeable. It is often used by the country people, in form of tea, against weakness of the stomach, flatulent cholic, uterine obstructions, hysteria, &c.

CALAMI'NTHA MAGNO FLORE, or *calamintha montana;* MOUNTAIN CALAMINT. This plant, the *melissa grandiflora* Linn. has a moderately pungent taste, and a more agreeable aromatic smell than the common calamint, and appears to be more eligible as a stomachic remedy.

CA'LAMUS; a general name denoting the stalk of any plant. It is also the name of a genus in Linnæus's botany, of which he enumerates one species.

CA'LAMUS AROMA'TICUS, *(calamus*, KALAM, Arab.) *acorus verus*, or *calamus vulgaris;* sweet flag, or ACORUS. It is the *acorus calamus scapi mucrone longissimo foliaceo* Linn. Class, *Hexandria.* Order, *Monogynia.*

This flag resembles, as to its leaves, the common *iris*, but, in other respects, differs greatly from it: the stalk grows at a little distance from the leaves; the lower half, up to where the flowers come forth, is roundish; the part above this, broad like the other leaves: the flowers are very small, whitish, and stand in a kind of head about the size of a finger. This plant grows plentifully in rivulets and marshy places, about Norwich and other parts of this island; in the canals of Holland; in Switzerland; and in other countries of Europe. The shops have been usually supplied from the Levant with dried roots, which do not appear to be superior to those of our own growth.

The root of the acorus is full of joints, crooked, somewhat flatted on the sides, internally of a white colour, and loose spongy texture: its smell is strong; the taste warm, acrid, bitterish, and aromatic; both the smell and taste are improved by exsiccation. This root is generally looked upon as a carminative and stomachic medicine, and as such is often made use of in practice. It is also given in anorexia, and with the cinchona in the cure of agues. It is thought by some to be superior in aromatic flavour to any other vegetable that is produced in these northern climates: but the specimens we have had an opportunity of examining, fall short, in this respect, of several of our common plants. It is, nevertheless, a sufficiently elegant aromatic. The leaves of the plant have a sweet fragrant smell, more agreeable, though weaker, than that of the root.

CA'LAMUS RO'TANG; the systematic name of the plant from which we obtain the gum named *dragon's blood.* See SANGUIS DRACONIS.

CA'LAMUS SCRIPTO'RIUS; a kind of canal at the bottom of the fourth ventricle of the brain, so called from its resemblance to a writing pen.

CA'LAMUS VULGA'RIS. See CALAMUS AROMATICUS.

CALCA'NEUS, or *os calcis;* the largest bone of the tarsus, which forms the heel. See TARSUS. It is situated posteriorly under the astragalus, is very regular in its shape, and divided into a body and processes. See BONES.

CA'LCAR CORO'LLÆ, in botany, the heel or spur of the corolla. The *nectarium* is so called, which terminates the corolla behind, like a cock's-spur, in calve's-snout; valerian; orchis; violet; balsam, *impatiens;* lark-spur, *delphinium;* fumatory; butter-wort, *pinguicula;* and water-milfoil, *utricularia.* See NECTARIUM.

CALCAREOUS EARTH; i. e. CALX or lime. See LIME.

CALCATRIPPA. See CONSOLIDA REGALIS.

CALCEOLA'RIA; a genus in Linnæus's botany. He enumerates three species. It is also the name of a species of VIOLA.

CA'LCES, METALLIC; metals which have undergone the process of calcination or combustion, or any other equivalent operation. These, in modern chemistry, are named oxids. See OXID.

CALCIFRA'GA, BREAK-STONE; an epithet given to the herb scolopendrum or spleen-wort, in Scribonius Largus.

CALCIGRA'DUS; a term used by Hippocrates, who means by it, one who, in walking, lays much stress upon his heels.

CALCINATION, (*calcinatio*, from *calx*, lime); a term given by chemists to that process by which minerals, when exposed to a certain degree of heat,

are deprived of their water; stones converted into lime; and metals into calces or oxyds. The effect of calcination on stones, &c. is described under the article LIME.

A metal never becomes calcined or oxydated, but when in contact with air. The more extensive this contact, the larger is the quantity of metal which becomes calcined or oxydated; and it is proved, that a given quantity of air can only serve for the oxydation of a given quantity of metal. Hence, when the surface of the melted metal appears covered with calx, this is always taken off, or raked to one side; otherwise the remainder, excluded from the air, would not undergo the change intended. If any coal, or other inflammable matter, be suffered to fall into the vessel, the effect expected from this operation will not be produced, and part of what is already calcined will be *revived;* that is, it will return into its metallic form again.

Those metals which require a strong fire to melt them, calcine with a much less heat than is sufficient to make them flow. Hence the burning or scorification of such iron or copper vessels, as are long exposed to a considerable fire without defence from the air. Gold and silver are not calcinable by any but a high degree of fire.

In calcination, the metals visibly emit fumes; nevertheless, the weight of the calx proves greater than that of the metal employed, owing to its absorption of oxygen from the atmosphere. The antimonial regulus gains about one eleventh part of its weight; zinc, sometimes one tenth; tin, above one sixth; and lead, in its conversion into minium, often one fourth.

The calcination of metallic bodies, gold, silver, and mercury excepted, is greatly promoted by nitre. This salt, exposed to the fire in conjunction with any inflammable substances, extricates their inflammable matter, and bursts with it into flame, accompanied with a hissing noise: this process is usually termed *deflagration* or *detonation.*

All the metallic oxyds and scoriæ are revived into this metallic state, by fusion with any vegetable or animal inflammable matter. They are all more difficult of fusion than the respective metals themselves; and scarcely any of them, those of lead and bismuth excepted, can be made to melt at all, without some addition, in the strongest fire that can be produced in the common furnaces. The additions, called fluxes, employed for promoting the fusion, consist chiefly of fixed alkaline salts: a mixture of alkaline salt with inflammable matter, as powdered charcoal, is called a *reducing flux*, as contributing at the same time to bring the oxyd into fusion, and to revive it into metal. Such a mixture is commonly prepared from one part of nitre, and two parts of tartar; by grinding them well together, setting the powders on fire with a bit of coal, or a red-hot iron, then covering the vessel, and suffering them to deflagrate or burn, till they are changed into a black alkaline coaly mass. This is the ancient reducing flux of the chemists, and it was called from its colour the *black flux.* Metallic calces, or scoriæ, mingled with twice their weight of this compound, and exposed to a proper fire, in a close covered crucible, melt, and resume their metallic form; but, though they receive an increase of weight in the calcination, the revived metal is always found to weigh considerably less than the quantity from which the calx was made, for the reasons already assigned. See OXIDATION.

CALCITRAPA. The plant thus called in the foreign pharmacopœias, is the *centaurea calcitrapa; calycibus subduplicato-spinosis, sessilibus; foliis pinnatifidis, linearibus dentatis; caule piloso* Linn. Every part of it is exceedingly bitter. The juice or extract, or infusion, are said to cure intermittents, and the bark of the root, and the seeds, have been recommended in nephritic disorders, and in suppression of urine.

CALCULARY; that part of a pear which consists of a congeries of little strong knots, dispersed through the whole parenchyma of the fruit. The calculary is most observable in rough-tasted or choak-pears. The knots lie more continuous and compact together towards the pear where they surround the *acetary.* About the stalk they stand more distant; but towards the cork, or stool of the flower, they still grow closer, and there at last gather into the firmness of a plum-stone. The calculary is no vital or essential part of the fruit; the several knots whereof it consists being only so many concretions or precipitations out of the sap.

CALCULUS, (dim. of *calx*, a lime-stone); otherwise named *calculus humanus*, and *bezoar microcosmicum;* a peculiar concrete, found in the human bladder, and occasionally in other cavities or passages.

It is only since the time of Scheele that we have become acquainted with the nature of urinary calculi, this subject having been quite in the dark before that great chemist discovered, in the year 1776, a peculiar acid (the lithic acid) in them, and at the same time found them to contain no lime, a circumstance which was soon after confirmed by the experiments of Bergmann. From this period, the chemists bestowed a particular attention upon the examination of urinary concretions, as appears from the writings of Dobson, Percival, Falconer, Achard, Hartenkeit, Tychsen, Link, Titius, Walther, Gartner, Brugnatelli, Pearson, and several others; some of whom confirmed the discovery of Scheele, while others contradicted, and others enlarged it.

But we are particularly indebted to Fourcroy and Vauquelin, who, since 1786, had turned their attention to this subject, for having made many experi-

ments, by which great light is thrown on the subject. We deem it highly proper to communicate to our readers, in the following extract, the interesting results of their chemical inquiries, principally on account of the influence they have on the diseased state of those parts on which urinary calculi are deposited.

We shall first speak of the *seat and physical properties of urinary calculi.*—Calculi are found in different parts of the urinary system, in the pelvis renalis, in the ureters, in the bladder, and urethra; but as they, for the most part, originate in the pelvis renalis, the calculi renales make the nucleus of the greatest number of urinary stones. The calculi renales differ greatly with respect to their external qualities; for the most part, however, they consist of small, concrete, roundish, smooth, glossy, and crystalline bodies, of a red-yellow colour, like that of wood, and so hard as to admit of polishing. On account of their minuteness, they easily pass through the urinary passages in form of gravel, which being sometimes of a rough surface, cause several complaints on their passage. But, in some instances, they are of too great a size to be able to penetrate through the ureters; in which case they increase in the kidneys, to the manifest injury of them. Calculi renales of this kind are generally of a brown, dark red, or black colour, and surrounded with several strata of coagulated blood and pus: they have also been observed of a yellow, reddish, and lighter colour; and some consisting of an homogeneous stony mass; but white or grey calculi renales are very rarely to be met with. Amongst the great number that were examined by Fourcroy, he only found one or two of a grey or blackish colour, and a composition similar to those which generally bear the name of mulberry-like stones.

The *stones in the ureters* are calculi renales, which, on passsing into the ureters, are prevented by their size from descending into the bladder, and frequently increase very much; they, however, rarely occur, but still rarer are the internal stony coverings of the ureters, which entirely obstruct the passage of urine; their colour is white, and they consist of phosphat of lime.

Calculi in the bladder are the most frequent urinary concrements that have been scientifically examined. They draw their first origin from the kidneys, whence they descend into the bladder, where they increase; or they immediately originate and increase in the bladder; or they arise from a foreign body that by chance has got into the bladder, which not unfrequently happens, particularly in the female sex. Concrements of this kind differ greatly in their respective physical qualities and external form, which, however, is generally spherical, oval, or compressed on both sides; and sometimes, when there are several stones in the bladder, they have a polyhedrous or cubical form; their extremities are frequently pointed or roundish, but they are very seldom found cylindrical, and more rarely with cylinders at their ends.

There is a great variety in the size of these calculi, and likewise in their colour, which is materially different according to their respective nature and composition. They occur, 1. Of a yellowish colour, like wood, approaching nearly to red or brown: such stones consist of lithic acid. 2. Grey, or more or less white: these stones always contain phosphats of earths. 3. Dark grey or blackish: stones of this colour have oxalats of earths. Many stones show brown or grey spots on a yellow or white ground, generally raised on the surface, and consisting of oxalat of lime, which is inclosed in lithic acid when the ground colour of the stone is of a wood colour, or in phosphat of lime when it is white. These spots are, in general, only to be observed in the middle of the stone, or at one of its extremities. What has thus been stated is the result of observations on more than 600 calculi; and different other colours that are said to have been observed, either arise from heterogeneous substances, or are merely variations of the above colours. Their surface is smooth and polished in some, in others only smooth, and in others uneven, and covered with rough or smooth corpuscles, which are always of a yellow colour; in some, the surface is partly smooth and partly rough. The white ones are frequently even and smooth, half transparent, and covered with shining crystals, that generally indicate phosphat of ammonia with talc; or they are faint, and consist of minute grains; or rough, in which case they consist of phosphat of lime. The brown and dark grey stones are, from their similarity to mulberries, called mulberry-stones, and, being frequently very rugged, they cause the most pain of all. See plate XV.

On examining the specific gravity of urinary calculi in more than 500 specimens, it was found to be in the lightest 1,213 : 1,000; in the heaviest, as 1,976 : 1,000. Their smell is partly strong, like urine and ammonia, partly insipid, and terreous; for instance, the white ones, which are like sawed ivory or rasped bone.

The internal texture of calculi is but seldom guessed from their external appearance, particularly when they exceed the size of a pigeon's egg. On breaking them they generally separate into two or three strata, more or less thick and even, which proves that they are formed by different precipitations at different times. In the middle a kernel is generally seen, of the same mass as the rest. When the place they are broken at is finely streaked, and of a yellow or reddish colour, the lithic acid predominates; but when they are half transparent, or luminous like spar, they have ammoniacal magnesia in them, and phosphat of lime

when they are brittle and friable; but when they are so hard as to resist the instrument, of a smooth surface, and a smell like ivory, they contain saccharic lime. It frequently happens, that the exterior stratum consists of white phosphat of earth, where the kernel is yellow lithic acid or oxalat of lime, covered sometimes with a yellow stratum of lithic acid, in which case the kernel appears radiant; but when it consists of lithic acid, and is covered with white phosphat of earth, it is roundish, oval, and somewhat crooked. These concrements have very seldom three strata; namely, on the outside a phosphat of salt, towards the inside lithic acid, and quite within side, an oxalat of lime; but still rarer these substances occur in more strata, or in another order, as before mentioned. Stones of the urethra are seldom generated in the urethra itself; however, there are instances of their having been formed in the fossa navicularis, by means of foreign bodies that have got into the urethra. We also very frequently observe stony concrements deposited between the glans and prepuce. All the concrements produced withinside and outside of the urethra consist of phosphats of earths, which are easily precipitated from the urine. There are likewise stones in the urethra, which have come out of the bladder, having been produced there, or in the kidneys, and they generally possess the properties of stones of the kidneys.

With regard to the *constituent particles of urinary stones*, it has been mentioned above, that Scheele found a peculiar acid in the urinary concrements, and likewise that phosphat of lime was discovered in them. The identity of the lithic acid, however, was much doubted by modern chemists, particularly by Dr. Pearson, who asserted that it was merely an oxyd, whereby he gave rise to the discoveries Vauquelin and Fourcroy since made on this subject, because they were induced to repeat the experiments which had been proposed to the public, in order to examine whether the lithic acid be really an acid, or to confirm the former opinion of it. Their endeavours were fully rewarded, as they not only found the lithic acid and phosphat of lime in the different calculi, but also five other substances, viz. the lithat of ammonia, oxalat of lime, siliceous earth, phosphat of ammoniacal magnesia, and an animal matter.

1. *Lithic or uric acid.*—The acid discovered by Mr. Scheele in the urinary concrements was styled lithic acid; or, according to Dr. Pearson's researches, uric acid; which, after Scheele, has the following properties: it is insipid, without smell, hard, crystallizable, not soluble in cold water, and in boiling water only in several thousand times greater quantity. This solution, after having become cool, deposits the acid in form of minute yellow needles, easily soluble in the ley of fixed alkalis, out of which, however, it is precipitated by all acids, even the carbonic acid, except the sulphuric and muriatic acids, which have no effect on it. Concentrated nitric acid, on dissolving it, obtains a red colour. On distilling the lithic acid, it yields a small quantity of sublimed, undecomposed uric acid, very little oil and water, crystallized carbonat of ammonia, carbonic acid, and a very black coal, which, however, contains neither alkali nor lime. Besides these properties, it possesses still others, according to our researches. On rubbing it with concentrated ley of kali or natron, it immediately forms a saponaceous, thick, and pulpy mass, which is very soluble in water when supersaturated with alkali, but little soluble when only saturated with it. The saturated combinations have little taste, are not crystallizable, and, when diluted with water, the muriatic acid precipitates the uric acid in form of small, needle-like, shining, somewhat yellowish crystals. Ammonia receives very little of it, which combination is almost quite indissoluble. Lime-water has likewise very little effect on it; and the carbonats of alkalis none at all. On being dissolved in nitric acid, a part of the lithic acid is changed into oxalic acid. The red colour which appears after this combination is said to prove, according to Pearson, that substance to be merely an oxyd, but it arises from a peculiar animal matter. When oxgenated muriatic acid is brought in contact with lithic acid, the colour of it grows pale, it puffs up, becomes soft and gelatinous, and at last obtains the consistence of a milky liquor; from which process only $\frac{1}{60}$ of a white, light, animal substance remains, and a quantity of carbonic acid evolves itself under continual slow effervescence. The liquor yields muriat of ammonia, oxalat of ammonia, both in crystals, free muriatic and malic acid; consequently, the oxygenated muriatic acid separates the uric acid into ammonia, carbonic acid, oxalic acid, and malic acid; whereby we observe, that the oxygenated muriatic acid changes the uric acid, first into ammonia and malic acid, but, on the addition of more acid, into oxalic acid; and, when still more acid is added, into water and carbonic acid. The remaining white substance is the same, from which the red colour originates that appears on the combination of the uric acid with nitric acid, and which imparts the cubical form to the muriat of ammonia, obtained by the evaporation of the liquor. It remains now to be stated, what is observed in the distillation of that acid, at which it yields not only carbonat of ammonia, but also carbonic gas, very little oil, Prussic acid, partly in form of gas, partly in a fluid form, a considerable quantity of coal that contains no salt, and a little water. The productions thus obtained have the smell of bitter almonds. The results of these inquiries manifestly show, that the lithic acid is really an acid of its own, consisting of azote, carbon, hydrogen, and

oxygen. This peculiar acid is an excrementitious substance, which is carried off by the urine, and at the forming of calculi, combines itself with a coloured animal matter, from which also it probably originates by a process still unknown.

2. *Lithat of Ammonia.*—This substance seems to have been unknown before, or at least not properly discerned from the uric acid, and though Scheele has observed it, he was ignorant of its particular nature. It is easily to be distinguished by the small even strata in which it is formed, by its colour, that looks like milk coloured with coffee, and by its forming but small calculi. It dissolves in the lees of kali and natron like the lithic acid, but with the characteristic difference that it discharges ammonia, a phenomenon already observed by Scheele. It is more soluble in cold as well as warm water, than the lithic acid. It is in the same way affected by acids, except that a greater quantity is required for changing it. It is generally mixed with phosphat of ammoniacal magnesia, because it seems only to take place after a sufficient quantity of ammoniacal magnesia has been formed, to saturate the phosphat of kali and the free uric acid.

3. *Phosphat of lime.*—The existence of this substance had hitherto been but inaccurately determined, every substance which was not lithic acid being formerly comprised by the name of phosphat of lime. It occurs in small friable strata, which break in scales or splints of a grey white colour, and are faint, opaque, without any smell or taste, and crystallized in a luminous or sparlike form; instead of strata it is frequently composed of friable grains, that slightly cohere, and has many holes and pores like a spongy texture. It never forms calculi by itself, being, in a calculus, always united with an animal gelatinous matter; on account of which circumstance it becomes black by exposing it to a strong heat, and burns to coal, exhaling the odour of burned bones; and yields water, oil, carbonat of ammonia, and a carbonaceous residuum. Being calcined white, it only leaves lime, and phosphat of lime, without any water of crystallization. It is not soluble in cold water, but in boiling water a part of its gelatine dissolves, spreading an animal odour. All acids, except the boracic and carbonic dissolve it, leaving on the bottoms of the vessels transparent spots of animal matter. These solutions are all precipitated by alkalis, but without any decomposition, the precipitation remaining phosphat of lime. On treating the phosphat of lime with concentrated nitric acid, a thick pulpy mass of acid sulphat and phosphat of lime will be obtained, on which pure alkalis, as well as carbonat of alkalis, have no effect. We never could find acid phosphat of lime, as Brugnatelli pretends to have observed.

4. *Phosphat of ammoniacal magnesia.*—It consists of scaly, half-transparent, hard and coherent strata; can be sawed without crumbling, and reduced to a fine soft and white powder. It is of a sweetish insipid taste, somewhat soluble, and crystallized in rhomboids, or thick lamina, dispersed in the cavities of other calculous substances, and it is frequently found on the surface of other concrements. It contains betwixt its strata a gelatinous substance, but less than the phosphat of lime, on which account it also blackens by being heated. Though it be but little soluble in water, yet it dissolves in such a quantity as to be capable of crystallizing by slow evaporation. Acids dissolve it more quickly than they do the phosphat of lime. Weak sulphuric acid entirely dissolves it, forming sulphat of ammoniacal magnesia. In diluted muriatic or nitric acid, it disappears more quickly than the phosphat of lime. Ammonia, by which the salt is made turbid, only precipitates small particles of magnesia. The lees of fixed alkalis disengage from it ammonia, without forming with it a solution; and depriving it of the phosphoric acid, leave the magnesia behind.

5. *Oxalat of lime.*—This is, according to our observations, only found in the mulberry-like calculi, in combination with a coloured animal matter, and consists of strata covered with pointed, roundish, rough or smooth protuberances: outside it appears of a dark or brown colour, but internally it is grey, frequently with white streaks, of a solid texture, and may be polished like ivory; it breaks in scales, or in the shape of shells; and, on being pounded or sawed, it exhales an animal odour like semen. It is the heaviest of all calculous substances, and the only one which yields one-third of lime by calcination. It dissolves with difficulty in acids, and is precipitated, unaltered, by alkalis, from nitric acid. The fixed alkalis decompose it when they are impregnated with carbonic acid, and when it is pulverised and the solution heated, whereby carbonate of lime and oxalat of alkalis are obtained.

The great quantity of animal matter which constantly adheres to this oxalat of lime is very characteristic; for this imparts the brown, reddish, blackish colour to the above kind of stones, and likewise their fine and solid texture. This substance may be obtained by putting small pieces of these stones into diluted nitric acid, whereby it appears of the same colour, and becomes soft and spongy. The great hardness of this kind of calculus, most probably arises from the intimate connection of its particles, produced by the combination of the oxalat of lime with that animal matter, in the same way as lime obtains a great degree of solidity by its combination with albuminous matter, of which, and of a peculiar matter of urine, that animal substance seems to consist.

6. *Siliceous earth.*—Amongst six hundred calculi which we examined, there were only two that con-

tained this earth; both had the texture of mulberry-like stones, though of a lighter colour, and by being calcined lost one-third of their weight, without giving free lime; heated with acids they lost nothing, but when melted with four times as much of alkali, they yielded siliceous earth, by being treated with muriatic acid. They contained phosphat of lime, and an animal matter similar to that which is united with the oxalat of lime. They were hard, difficult to be sawed and pulverised, and the powder made scratches in metal. On being burnt they emit an animal odour; they imparted nothing to the boiling water, and to the acids a little phosphat of lime, which difficultly separates from the siliceous earth. Alkalis, either pure, or combined with carbonic acid, did not affect them, merely depriving them of a part of their animal matter. Their essential character consists in their being fusible and vitrifiable with fixed alkalis.

7. *Animal matter.*—All the six substances just examined, which constitute the urinary stones of the human species, are always combined with an animal matter, as appears from its being burnt to coal, from the productions it yields by distillation, from its stench on being burnt, and from the cellulous membranous flocculi which remain when pieces of calculi are dissolved in diluted acids. This animal matter has been frequently, and with good reason, considered as the basis of all urinary concrements, like as in bones the gelatinous matter, the first basis of the bones, forms an organic texture, in the interstices of which the phosphat of lime is deposited. It is very remarkable, that the different constituent particles of urinary stones are combined with a dissimilar animal matter, which is sometimes albuminous, sometimes gelatinous, sometimes composed of both, and frequently united with the matter of urine. Thus the lithic acid, or the lithat of ammonia, contains a third of albuminous matter, combined with the matter of urine, the phosphats of earths, albuminous matter, gelatine in form of membranes, and laminas, or tela cellulosa; the oxalat of lime, a spongy, yet more solid texture of the colour of albumen, and the siliceous earth, a similar substance. On the whole, the animal matter seems to unite and join together all the acid and saline particles of urinary concrements.

The old *classification of urinary calculi*, made according to their figure and their size, cannot at present, where we have acquired so accurate a knowledge of their internal nature, be retained, as they ought rather to be classed according to their constituent particles; however, no regard is to be had to the animal matter, as being found in all urinary concretions, and having no influence on their respective differences. On comparing the results of the analyses of more than six hundred stones, we are induced to bring them under three genera: the first of which comprehends such stones as are merely composed of one substance, besides the animal matter: the second contains urinary concretions, consisting of two stony substances, besides the animal matter; and the third comprises all those which are formed by more than three calculous substances. These three genera comprehend about twelve species, namely, the first genus three, the second seven, and the third two; all of which we shall now describe; but we must previously remark, that the number of the genera, as well as of the species, is only determined after the observations hitherto made, and may consequently be increased in future.

1. *The first species* of urinary concretions consists of lithic acid; and stones of this kind most frequently occur, as there were amongst 600, about 150. They are easily distinguished by their reddish or high yellow colour, much resembling that of wood, by their brittle, radiant-like, homogeneous, and fine texture, and by their perfect solubility in the leys of fixed alkalis, without disengaging the smell of ammonia. Their size varies from the bigness of a pea to that of a duck's egg, &c. and their figure is roundish, spheroidical, compressed, oval, oblong, &c. the surface polished like marble, but frequently rough and warty; of a crimson light red, yellowish, light brown colour, but never white, grey, or black; their strata differ in number and thickness, and are frequently of a smooth surface. The specific weight of these stones is from 1,276, to 1,786, but generally more than 1,500. The urinary concretions in the kidneys are mostly of this species.

2. *The second species* is composed of lithate of ammonia, and differs from the former by disengaging ammonia on their being dissolved in the leys of fixed alkalis. Concrements of this kind are generally small, of a pale or grey colour, and consist of fine strata, easily separable from each other; they mostly contain a kernel, which is easily separated from the strata that cover it. Their figure is generally oblong, compressed like almonds, and of a smooth surface, which is frequently crystalline. Their specific weight varies from 1,225 to 1,720. They are entirely soluble in water, particularly when previously pulverised. All acids, principally the muriatic acid, deprive them of the ammonia, leaving the pure lithic acid behind. They are frequently found covered with a thin stratum of lithic acid. Amongst 600 calculi there were but few of this kind.

3. *The third species*, consisting of oxalat of lime, are easily to be distinguished by the protuberances and inequality of their surface, whence they have got the appellation of mulberry-like stones; by their hardness, grey colour, solid texture, their polish like ivory, in the inside, and their particular smell on being sawed, which resembles that of semen. A peculiar characteristic, which distinguishes

them from all others, consists in their leaving lime after their calcination, in their being with difficulty soluble in acids, and not soluble in alkalis, and, at last, in their being decomposed by the lees of carbonats of alkali. They weigh from 1,428 to 1,976, and their size varies from that of a calculus renalis to the bigness of an egg or more; their figure is generally spherical or spheroidical. They often form the nucleus of other stones, in which case they belong to another species. In 300 stones they bore the proportion of about $\frac{1}{4}$ or $\frac{1}{5}$.

4. *Stones of this species* contain lithic acid and phosphat of earth, but in a separate state. Their surface is white, cretaceous, brittle, and half-transparent, as it either consists of phosphat of lime, or of phosphat of ammoniacal magnesia, the kernel being formed by lithic acid; thus both constituents are exactly separate from each other. They were found in the proportion of $\frac{1}{12}$ amongst the stones that were examined by us, and they grow bigger than any of the rest, as they appear from the size of an egg to that of the whole bladder, even when extended. They generally have an oval form, often pointed at one end, of a smooth surface, which, however, is frequently covered with phosphat of lime, and phosphat of ammoniacal magnesia. Sometimes the lithic acid in the middle is alternately covered with phosphat of lime, and phosphat of ammoniacal magnesia. The specific weight of these stones is extremely variable.

5. *The fifth species of calculi* contains, likewise, lithic acid and phosphats of earth, but intimately mixed with each other. Of these stones a great many varieties are observed, depending on the proportionable quantity of their constituent particles, as well as on the strata in which they lie above one another. The chief constituents, the phosphats of earth, are separated in different strata, but sometimes so intimately mixed with each other, that it is impossible to distinguish them with the eye; and the analysis could only show their difference. From this circumstance arise the variety in the colour, figure, and number, of the strata. The colour, however, is generally grey, but frequently variegated like marble, sometimes like soap. Their figure is irregular, oval, or globular, and the surface mostly brittle, cretaceous, or whitish, so as to make us believe that they only consist of phosphat of lime. The polyhedrous stones generally belong to this species, when they have the appearance of being worn away by rubbing. They make about $\frac{1}{5}$ of the stones we have examined. Their specific weight varies extremely, the least being 1,213, the greatest 1,739.

6. *This species* is constituted by lithat of ammonia and phosphat of earth, *i.e.* of lime and ammoniacal magnesia; and resembles, in its external appearances, the fourth species. One of the constituents, generally the lithat of ammonia, makes the kernel, while a mixture of the two others, but rarely one by itself, forms the crust. Sometimes, however, the kernel contains also the phosphats, and the crust a little lithat of ammonia, which, even in some varieties, is mixed with pure lithic acid. The strata in stones of this kind are more easily separable, and always smaller than those of the fourth species. Their specific weight is 1,312 to 1,761; and they are more rarely met with than most of the rest. Amongst 600 there were only 20 of this kind.

7. Stones of the *seventh species* consist likewise of lithat of ammonia and phosphat of earths, but intimately mixed with each other. They are of a paler colour, much lighter than the fifth species, and disengage a great deal of ammonia on their being treated with kali. We found them only in the proportion of $\frac{1}{40}$, amongst the stones which we have analysed. They never grow so large as the two former.

8. The constituent particles of the *eighth species* are phosphat of lime, and phosphat of ammoniacal magnesia. The pure white colour, the friability, their being insoluble in alkalis, and their easy solubility even in weak acids, constitute the chief characteristics of this sort of stones, of which we found about 60 amongst 600. Sometimes they are of an enormous size, of irregular forms, rarely round, but frequently of an uneven surface, and resembling an incrustation. Their texture is formed of white brittle strata, sometimes interwoven with solid half-transparent crystals of ammoniacal magnesia. The crusts formed on foreign bodies that happened to penetrate into the bladder, belong to this species; the specific weight of which is 1,138 to 1,473.

9. This species of stones contain oxalat of lime, but externally uric acid, in more or less quantity, and are only to be distinguished by the kernel from the first species. The proportion of both constituents, and the specific weight, vary extremely, the latter being 1,341 to 1,754. Sometimes the kernel, consisting of oxalat of lime, is only covered on one side with uric acid, and discernible on the other by the protuberances with which the surface is variegated; which variety, however, seldom occurs.

10. Stones of this species have, in their centre, oxalat of lime, surrounded by phosphat of earths; the kernel is grey or brown, and radiant; the crust white and cretaceous; their size and figure differ extremely, and their specific weight is from 1,168 to 1,752. They amount to $\frac{1}{5}$ of the stones we have examined.

11. This species contains stones composed of three or four calculous substances, namely, of oxalat of kali, phosphat of earths, and of uric acid, either pure or combined with ammonia. They rarely occur; and amongst 600 stones we only ob-

served ten or twelve. They often consist of three distinct strata, viz. In the interior, of oxalat of lime; in the middle, of lithat of ammonia; and the exterior, of phosphats of earth, which are frequently mixed with uric acid, or lithat of ammonia, all which are distinguished on their being sawed through. This species comprehends three varieties; the first of which consists of oxalat of lime, uric acid, and phosphats of earth; the second contains lithat of ammonia, combined with pure uric acid, and the two other constituents; the third has, besides these two substances, free uric acid and lithat of ammonia, mixed with the phosphats of earth. We forbear to mention other varieties of this species, as being less remarkable and instructive.

12. The last species of calculus is of a very multifarious composition. The siliceous earth seems to have taken the place of the oxalat of lime; it is mixed with uric acid and lithat of ammonia, and covered by phosphats of earth. Stones of this kind are the rarest of all, and there were only two amongst six hundred specimens.

In pl. XV. we have exhibited some specimens of urinary and renal calculi, most of them from the museum of Dr. Cheston, of Glocester.

Fig. 1. Is a bladder-calculus of the common kind.

Fig. 2. A stone taken from a patient on whom Dr. Cheston performed lithotomy twice, and whose case was attended with such difficulties as obliged him to break the stone in the bladder. The end (broken to appearance) was where it separated from the stone in the bladder, around the jagged end of which appears an indentation from the neck of the bladder. The under or bulbous side was formed in the urethra, and was felt, when he performed the second operation, where the incision is made in perinæo. The smaller or pointed end continued up the urethra so as to be felt somewhat under the scrotum.

Fig. 3 and 4. Two stones taken from the bladder of the same person, remarkable for their shape, and still more so for their appearing as if they had been broken and their parts re-united by a different substance, as in the fossil called *septarium*.

Fig. 5. Two views of a stone taken out of the bladder of the Rev. Mr. T. Champnes, by Mr. W. Sharp, on the 12th of May, 1766, weighing one ounce and a drachm. The stone having been dislodged, by accident, from its original situation, (where it had rested with very little inconvenience to the patient) fell down to the neck of the bladder, one point of it projecting into the urethra, causing spasms and intolerable pain; he was obliged to be cut during the fit, as the only possible means of saving his life, it being impracticable to pass the sound, or to return the stone back into the bladder.

Fig. 6. A calculus to show an additamentum at each end, formed, as Dr. Cheston supposes, after the kidneys were in a state of purculency.

Fig. 7. A stone from the kidney, whose nucleus consists of regular crystallizations.

Fig. 8. A stone from the same kidney, formed laminatim, and of a much more earthy texture.

Fig. 9. A biliary calculus, which passed by the intestines during the patient's life time.

To enquire into *the causes by which urinary concretions are produced*, is both interesting and useful, however attended with the greatest difficulties. The writings of medical authors are full of conjectures and hypotheses with regard to this subject, on which nothing could be ascertained before we had acquired an accurate knowledge of the nature of urinary concretions. It is owing to this circumstance that the most enlightened physicians acquiesced in ascribing the immediate cause of them to a superabundance of terreous matter in the urine; and Boerhaave, as well as, particularly, Van Swieten, imagined that the urine of all men contained calculous matter in the natural state, and that, for the generation of stones, a nucleus was only required to attract it. That this may be the case, in some instances, is proved by frequent experience; but stones produced by foreign bodies, that have accidentally got into the urethra or bladder, are always white and composed of phosphat of earths, and seldom or never covered with lithic acid, a substance which is observed to form the stones that most frequently occur; but even in these the kernel consists of a substance formed in the body itself, as a grain descended from the kidneys, &c. which must, therefore, have necessarily originated in a peculiar internal cause. A superabundance of uric acid in stony patients, and its more copious generation than in a sound state, though it seems to be one of the principal and most certain causes, is by no means satisfactory, as it only explains the precipitation of stony matter from the urine, but not why it unites in strata. A coagulating substance is required for separating, attracting, and, as it were, agglutinating the condensible particles that are precipitated. This substance is undoubtedly the animal matter which we have constantly found in all calculous masses, and which seems to constitute the basis of stones, like the membranous gelatina that of bones. It is known that the urine of calculous patients is generally muddy, ductile in threads, slimy, and as if mixed with albumen, which quality it obtains at the moment when the ammonia is disengaged, or on the addition of kali that separates it from the acid in which it was dissolved; and in all cases of superabundance of lithic acid the urine contains a great quantity of that animal matter, which promotes the precipitation of it, and attracts and unites the particles thus separated. Hence it appears, that every

thing capable of increasing the quantity of that pituitous gluten in the urine may be considered as the remote cause of calculous formations. And the old ideas on pituitous temperaments, or superabundant pituita, &c. which were thought to dispose people to the calculus, seems to be connected with the late discoveries on the nature of urinary stones. Though the animal matter appears to be different in different calculi, yet it is certain, that every calculous substance contains an animal gluten from which its concrete and solid state arises; whence we may fairly state the superabundance of that substance as the chief and principal cause of calculous formation.

There are, however, other causes which seem to have a particular influence on the nature of urinary stones and the strata in which they are formed; but it is extremely difficult to penetrate and to explain them. We are, for instance, entirely ignorant of the manner in which urinary stones are formed from the oxalat of lime; though from their occurring more frequently in children than in adults, we might be entitled to ascribe them to a disposition to acor, a cause considered by Boerhaave as the general source of a great number of diseases incident to the infantile age. This opinion seems to be proved by the ideas of Bonhomme, physician at Avignon, on the oxalic or saccharic acid, as the cause of mollities ossium in the rickets; by this acid being discóvered in a species of saliva by Brugnatelli; and, lastly, by an observation of Turgais, who found this acid in the urine of a child diseased with worms. We but rarely observe saccharic acid in the human body, which appears to be mostly adventitious, and by which the animal matter is rendered coagulable, and deposited or precipitated with the oxalat of lime; or the oxalic acid decomposes the phosphat of lime, and forms an insoluble combination incapable of being any longer kept dissolved in the urine. It is, however, extremely difficult to determine how far the constitution of the body is connected with that particular disposition in the urine, of precipitating sometimes phosphat of lime mixed with oxalat of lime, sometimes phosphat of ammoniacal magnesia, either by itself or mixed with lithic acid, &c. &c. Who can explain the reason, why of 600 stones there were only two in which siliceous earth could be traced? Still more difficult it is to explain the causes why the above substances precipitate either at once or in different strata; but it may suffice to have shown how many observations and experiments are required, and what accurate attention and perseverance are necessary in order to throw light on so difficult a subject. We are only enabled to obtain satisfactory explanations concerning those questions by an accurate chemical analysis of the urine of calculous patients in different years of their age; an undertaking which, however difficult, has enriched us with some interesting and successful results, and is worthy the attention of those who possess the opportunities of doing it.

After these remarks it is highly proper that we should advert to what is more immediately practical with regard to the means by which a stone in the bladder is to be discovered and removed, or those by which the symptoms can be alleviated.

A variety of causes have been assigned as tending to the formation of calculi in the bladder; as we have just now seen. After a calculus has begun to be formed, it sometimes acquires a great size in a few months from the first obvious symptoms; but sometimes it remains in the bladder for many years without arriving at any considerable size.

1. *Stone in the Bladder.*—The *symptoms* indicating the existence of a calculus in the bladder generally come on gradually, and bear some kind of proportion to the size and inequalities of the stone. One of the first commonly taken notice of, is an uneasy sensation at the point of the urethra, which for some time is perceptible only upon making water, or upon using violent or jolting exercise. This sensation gradually increases; and there is also a frequent desire to make water, which is commonly voided in small quantities, and sometimes only in drops. When running in a full stream it often suddenly stops, though the patient is conscious that a considerable quantity still remains, and feels a strong inclination to void it. If the stone be large, the patient has a constant dull pain about the neck of the bladder, and frequent desire of going to stool. The urine is generally of a limpid colour; but it is frequently thick, depositing a mucous sediment, and when the disease is violent, it is often tinged with blood. All these complaints are greatly increased by exercise, especially by riding on horseback; and from a long continuance of pain, the patient's health by degrees becomes much impaired, and unless effectual means are employed for removing the cause of the disorder, death alone puts an end to his misery.

We are rendered certain of the existence of calculus when small pieces of stone are frequently passed along with the urine. When this does not occur, we cannot be certain that the symptoms do not arise from an ulcer or tumor in the body or neck of the bladder, or from the pressure of tumors in the neighbouring parts. In doubtful cases, however, we have one mark by which we can judge with certainty, and that is by means of SOUNDING, the method of doing which is described under that article.

For the radical cure, by the removal of the stone, see LITHOTOMY, and for the means of diminishing its bulk or alleviating its effects where that method is not resorted to, see LITHONTRIPTICS.

2. *Stones in the Kidneys.*—The symptoms of stone in the kidneys are, pain in the region of the kidneys, sickness, and vomiting, the urine sometimes mixed with blood, at other times with mucus, or even purulent matter; but the same symptoms are often induced by other causes, especially from inflammation and suppuration of the kidney. Nephritic complaints have frequently subsisted for a long time, where stones have been blamed as being the cause of them; and yet upon dissection purulent matter alone has been detected. From this circumstance, as well as from the great depth of the parts, and the large size of the blood-vessels of the kidneys, the operation of nephrotomy could not be performed, but with the greatest uncertainty and most imminent danger, and is therefore never attempted. A few cases indeed have appeared, where inflammation, induced by a stone in the kidney, terminated in abscess, and the stones were taken out; but it was not till they had worked their way out of the kidneys into the cellular substance, so that it only remained to open the abscess and extract them; but otherwise the operation is never to be thought of. For the means of alleviating the symptoms in cases of renal calculi, see NEPHRITIS.

3. *Stones in the Urethra.*—Those who are troubled with calculous complaints frequently pass small stones along with their urine: and when these are angular or of considerable size, they sometimes stick, and give much uneasiness. The symptoms are at first pain, then inflammation and swelling, attended with a partial, or a total suppression of urine, which, if long neglected, is apt to terminate in a rupture of the urethra, when the urine will be discharged into the neighbouring parts. The greatest attention is therefore necessary to get the stone extracted as soon as possible.

When the stone is in the urethra, unless it be of a large size, or has been long impacted, and the inflammation great, attempts ought to be made with the fingers to push it out; but previous to this, the penis should be relaxed as much as possible, so as to remove a certain degree of spasm which the presence of stone here probably creates. Blood ought to be drawn by general or local means, according as the patient may be of a plethoric or emaciated habit. He should be immersed in a warm bath, and get a full dose of laudanum, and warm oil ought also to be thrown into the urethra. After these remedies have relaxed the parts as much as may be, the extraction is to be attempted.

For this purpose certain instruments have been contrived, particularly a tube containing a pair of elastic forceps, (see plate VI.) to be introduced into the urethra so as to lay hold of the stone. In some cases they certainly might answer the purpose, but they have not been found very useful; and as they may increase the irritation already present in the urethra, they are seldom, if ever, employed. Instead of them, the surgeon uses gentle pressure on the penis to push the stone outwards; and as calculi larger than a field bean have sometimes been passed by the urethra, an operation ought not to be performed till gentle means have been persisted in for some time. When these means have failed, an incision ought to be made immediately upon the stone, which is then to be removed by a probe, or with a pair of small forceps. When a stone is lodged near the neck of the bladder, after the patient has been placed and secured in the same manner as for the lateral operation, while an assistant supports the scrotum and penis, the operator introduces a finger, oiled, into the anus, to support the stone in its place, and prevent it from slipping into the bladder. An incision is then to be made, and the stone turned out. The after-treatment will be nearly the same as that after the operation of lithotomy.

When, again, a stone has advanced further in the urethra, the best method is to draw the skin strongly forwards or backwards, and then to cut upon it and turn it out, when the skin will slide back so as to cover the wound, and prevent the urine from passing through it; and by this means it will generally heal by the first intention. If part of the urine pass through the wound, and insinuate into the cellular substance, an attempt is to be made with the hand to press it back. If that prove insufficient, a cut is to be made through the skin opposite to the incision of the urethra; but this will seldom be found necessary. If a stone is fixed near the point of the urethra, it may be removed with a pair of forceps; for if this fail, the urethra is to be dilated with a scalpel; and if this also be insufficient, an incision is to be made as above directed. When the cure is nearly completed, a tube formed of silver or elastic gum, or a hollow bougie, may be used to keep the urethra of a proper size.

The worst part of the urethra for a stone to stick in, is that immediately behind the scrotum; for then the urine is apt to pass by the incision into the cellular substance of the scrotum, so as to occasion large swellings there. To prevent this, a stone so situated ought, if possible, to be pushed forwards with the fingers; or if this be impracticable, it should be pushed back into the perinæum by means of a staff. If both methods fail, a cut is to be made at the under part of the scrotum, which is to be well supported, and at one side of the septum, and continued upwards till the stone is felt, when an incision is to be made into the urethra, and the stone extracted as before directed.

CA'LDAR, an ancient name for tin.

CALDA'RIUM, a vessel used in the baths of the ancients to hold hot water. It is also called *laconicum.*

CALDE'RIÆ ITA'LICÆ, hot baths near Fer-

rara, in Italy, much resorted to in cases of suppression or difficulty of urine.

CA'LEA, a genus in Linnæus's botany. He enumerates four species.

CALEFACIE'NTIA, (from *calidus*, warm, and *facio*, to make), calefacients; i. e. medicines, or other substances, which excite a degree of warmth in the parts to which they are applied; as *piper*, *spiritus vini*, *&c.*

CALENDA'RIUM FLO'RÆ, a floral calendar; or one consisting of an exact register of the respective times, in which the plants of any given province, or climate, germinate, expand, and shed their leaves and flowers, and ripen and disperse their seeds. See *Phil. Bot.* p. 276. Such a list must be equally curious and useful to botanists. See the article DEFOLIATIO.

CALE'NDULA, (*quod singulis calendis*, i. e. *mensibus*, *florescat;* so called because it flowers every month); the *caltha vulgaris* or single MARIGOLD. The flowers and leaves of this plant, which is the *calendula officinalis: seminibus cymbiformibus*, *muricatis*, *incurvatis*, *omnibus*, Linn. have been exhibited medicinally. The former, were reckoned aperient in uterine obstructions and icteric disorders, and as diaphoretics they were used in exanthematous fevers; the leaves were given as gentle aperients, and to promote the secretions in general. They are now, however, little, if at all exhibited in medical practice.

CALENTURE, a febrile delirium, said to be peculiar to sailors, wherein they imagine the sea to be green fields, and, will throw themselves into it if not restrained. Bonetus gives an account of it; as also does Dr. Stubbs, in the Philosophical Transactions.

CALE'SIUM; a tall tree growing in Malabar, which bears clusters of berries like grapes or currants. These berries contain a flat stone with a kernel in it. Of the wood the natives make sheaths for knives and swords, &c. The bark, made into an ointment with butter, is used to cure wounds and ulcers. The juice of the bark removes aphthæ; and, taken inwardly, the dysentery.

CALF, the young of the Cow, (see Bos). This animal supplies the aliment called Veal. See VEAL.

CALF'S-SNOUT. See ANTIRRHINUM.

CA'LIDÆ, (from *calor*, heat); in botany, an epithet applied to plants that are natives of warm climates. Such are those of the East-Indies, South-America, Egypt, and the Canary islands. These plants, says Linnæus, will bear a degree of heat, which is as 40, on a scale, in which 0 is the freezing point, and 100 the heat of boiling-water. In the 10th degree of cold, they cease to grow, lose their leaves, become barren, are suffocated, and perish. *Phil. Bot.* p. 277.

CALIDA'RIUM, a name given by Celsus to that part of a bath which was the *hypocaustum* of the ancient Greeks.

CALIE'TA or CALIETTE; the young fungi which are found on the juniper tree.

CALI'GO, the same as CATARACTA; the cataract. This disease of the eye, is known by diminished or destroyed sight; and by the interposition of a dark body between the object and the retina. It is arranged by Cullen in the class *locales*, and order *dysæsthesiæ.* The species of cataract are distinguished by ancient writers according to the situation of the interposed body; hence the terms *caligo lentis*, *caligo corneæ*, *caligo pupillæ*, *caligo humorum*, and *caligo palpebrarum.* See CATARACT.

CA'LIX. See CALYX and PERIANTHIUM.

CA'LIX, of the kidneys. The term calix is given to the membrane which covers the papillæ in the pelvis of the human kidney.

CALL, an English name for the mineral called Tungsten, or Wolfram, by the Germans. See TUNGSTEN.

CA'LLA, African *arum*, a genus in the Linnæan system of botany. He enumerates three species.

CALLICA'RPA, a genus in Linnæus's botany. He enumerates three species.

CALLI'GONUM, (from καλλος, *beauty*, and γονυ, *a joint*, or *knot)*, polygonum. See POLYGONUM. It forms a genus in Linnæus's botany.

CALLIOMA'RCUS, the Gaulish name in Marcellus Empiricus for the herb coltsfoot.

CALLI'SIA, a genus in Linnæus's botany. There is but one species.

CALLITRI'CHE, STAR-WORT, a genus in Linnæus's botany. He enumerates two species.

CALLOSITY, (*callositas*, from *callus*, hardness); thickening with hardness, or induration. The term is employed in surgery to express a hardness of the cicatrix after the healing of ulcers, or any unnatural condensation of the cellular membrane, arising from inflammation or long pressure on a part. See CALLUS.

CALLOUS, a surgical epithet, signifying that a part is morbidly hardened or indurated; as in the callous edges of ulcers, &c.

CALLOUSNESS, the same as CALLOSITY; i. e. hardness, or induration.

CA'LLUS, or CALLOSITY, in a general sense, any corneous, or osseous hardness, whether natural or preternatual. In its most common acceptation, however, it means the callus surrounding a fractured bone. The term, in this last sense, denotes a sort of gelatinous matter, that is supplied from the small arteries and bony fibres of the divided parts, filling up all the chinks or cavities between them. It first appears of a gelatinous substance; but at length becomes solid bone, and joins the fractured parts so firmly together, that the limb will often make greater resistance to any external violence

at this part than at those parts which were never broken. The hard, dense, insensible knobs, rising on the cuticle of the hands, feet, &c. by much friction and pressure against hard bodies, are also called by this name.

CA'LMUS, in botany, the stalk of a plant. See BOTANY.

CALOCA'TANUS, a name for the wild poppy.

CALO'MBA. See COLUMBA.

CALOME'LAS, (καλομελας; from καλος, good, and μελας, black; from its virtues and original colour), CALOMEL. That which is now called Æthiop's mineral, or *hydrargyrus cum sulphure*, was formerly and properly named *calomel*, but the term now means a white preparation of sublimed mercury. This preparation is a muriate of mercury, and distinguished by its being sublimed from the other muriate of mercury, which is precipitated.

Calomelas. Lond.

Take of Muriated quicksilver, one pound;
Purified quicksilver, nine ounces;

Rub them together till the globules disappear, and sublime;—then rub all together again, and sublime; and in the same manner repeat the sublimation four times; afterwards, rub the matter to a fine powder, and wash it with boiling distilled water.

Sub-murias Hydrargyri. Edin.

Take of Muriated quicksilver, reduced to powder in a glass mortar, four ounces;
Purified quicksilver, three ounces and an half;

Mix them well together, by long trituration, in a glass or marble mortar, until the quicksilver ceases to appear. Put the powder into an oblong phial, of such a size, that only one third of it may be filled; and sublime it from a sand heat. When the sublimation is finished, let the phial be broken, and the red powder about the bottom, and the white about the neck, both thrown away; but the remaining mass is to be sublimed three or four times, and reduced into a very fine powder.

Hydrargyrum Muriatum mite sublimatum. Dubl.

Take of Corrosive muriated mercury, one pound;
Purified quicksilver, nine ounces:

Rub them together till the globules are imperceptible, and sublime. Rub the sublimed matter with the residuum, and repeat the sublimation. Lastly, wash the sublimed matter with frequent effusions of boiling distilled water.

The trituration of corrosive sublimate with quicksilver is a very noxious operation. For it is almost impossible, by any care, to prevent the lighter particles of the former from arising, so as to affect the operator's eyes and mouth. It is nevertheless of the utmost consequence, that the ingredients be perfectly united before the sublimation is begun. It is necessary to pulverise the sublimate, before the mercury is added to it; but this may be safely performed, with a little caution; especially if, during the pulverisation, the matter be now and then sprinkled with a little spirit of wine. This addition does not at all impede the union of the ingredients, or prejudice the sublimation: it will be convenient not to close the top of the subliming vessel with a cap of paper at first (as is usually practised), but to defer this till the mixture begins to sublime, that the spirit may escape.

The rationale of this process deserves particular attention; and the more so, as a mistaken theory herein has been productive of several errors with regard to the operation of mercurials in general. It is supposed, that the dulcification, as it is called, of the muriated quicksilver, is owing to the spicula or sharp points, on which its corrosiveness depends, being broken and worn off by the frequent sublimations. If this opinion were just, the muriated quicksilver would become mild, without any addition, barely by repeating the sublimation; but this is contrary to all experience. The abatement of the corrosive quality of the sublimate is entirely owing to the combination of so much fresh mercury with it, as is capable of being united; and by whatever means this combination is effected, the preparation will be sufficiently dulcified. Triture promotes the union of the two, whilst sublimation tends rather to disunite them. The prudent operator, therefore, will not be solicitous about separating such mercurial globules as appear distinct after the first sublimation. He will endeavour rather to combine them with the rest, by repeating the triture and digestion.

The college of Wirtemberg require their calomel to be only twice sublimed; and the Augustan but once; and Neumann has proposed making it directly, by a single sublimation, from the ingredients which the muriated quicksilver is prepared from, by only taking the quicksilver in a larger proportion. If the medicine, made after either of these methods, should prove in any degree acrid, water boiled on it for some time, will dissolve and separate that part in which its acrimony consists. The marks of the preparation being sufficiently dulcified, are, its being perfectly insipid to the taste, and indissoluble by long boiling in water. Whether the water, in which it has been boiled, has taken up any part of it, may be known by dropping into the liquor a ley of any fixed alkaline salt, or any volatile alkaline spirit: if the decoction has any mercurial impregnation, it will grow

turbid on this addition; if otherwise, it will continue liquid. But here care must be taken not to be deceived by an extraneous saline matter in the water itself: most of the common spring waters turn milky on the addition of alkalis; and therefore, for experiments of this kind, distilled water, or rain water, ought to be used.

The names of *calomelas* and *aquila alba*, as we see, have been dropped by the Edinburgh and Dublin colleges. *Calomelas*, though yet retained by the London college, is indeed a very improper name for a white preparation, the word implying a black colour. By treating this preparation with volatile alkali, it becomes blackish, and this perhaps is the calomel of the ancients.

Calomel appears to be one of the most useful preparations of this mineral. By proper management it may be made to increase, in a remarkable manner, almost any of the secretions or excretions. One grain mixed with sugar, and snuffed up the nostrils, is recommended as a powerful errhine in amaurosis. The same mixture is blown into the eye, to remove specks from the cornea. When joined with the preparations of antimony, it has a remarkable tendency to produce ptyalism; and in anomalous affections combined with syphilis, it has been found to produce good effects in that form. Given in doses of one grain morning and evening, or in larger doses combined with opium, to prevent it from acting as a purgative, it also affects the mouth and excites ptyalism. In larger doses of five grains and upwards, it is an excellent purgative. Combined with diuretics, it proves diuretic, and with sudorifics, sudorific.

It is one of the preparations of quicksilver which is capable of curing syphilis in every form. It also produces very powerful and salutary effects in obstructions and chronic inflammations of the viscera, especially of the liver; and, in general, it is applicable to every case in which mercurials are indicated.

The officinal preparations, in which calomel is an ingredient, are:—Pulv. scam. cum calom. *Lond.* Pulv. stibii comp. *Dubl.*

CALOPHY'LLUM, a genus in Linnæus's botany; of the monogynia order, belonging to the polyandria class of plants, and in the natural method classed under those called *doubtful.* The corolla is tetrapetalous; the calyx tetraphyllous and coloured; the fruit a globose plum. There are two species, both natives of India.

CA'LOR, heat. See CALORIC. Linnæus, in assimilating the vegetable with the animal kingdom, terms heat the *heart* of plants. He says—"*Cor* plantis nullum, sed calor efficit omne: nec opus est corde, ubi nec perpetui mobilis effectus necessarius est, & ubi propulsio, non circulatio humorum." *Phil. Bot.* p. 93.

CALO'RIC, (*caloricum*, from *calor*, heat); a name given, in the new chemistry, to HEAT, or the *matter of heat*, one of the most important agents in nature, and perhaps the most difficult of investigation.

1. Bodies, when heated, exhibit different phenomena, which have led to a supposition that heat is a distinct substance. Lord Bacon, Mr. Boyle, Sir Isaac Newton, and some other learned men, have, however, thought heat to be only a certain modification of which bodies are susceptible. It is very evident that both natural philosophers, and other men, have generally considered its presence as a sure indication of the presence of fire; have frequently confounded it with that element; and sometimes considered it as one of the distinguishing properties of fire.

The leading properties of heat are, to penetrate through all bodies; to diffuse itself equally, and to tend to an equilibrium; to dilate all substances into which it enters, causing them to pass from a solid to a fluid state, and from that to assume the form of elastic fluids, or gases.

It is generally communicated to bodies in one or other of these three ways; by contact, by motion, or by combination. Every one must have observed, that when two fluids different in temperature, the one sensibly warm, and the other sensibly cold, are mixed together, the former loses part of its heat, which is communicated to the latter, so that the temperature of both becomes the same. It is equally well known, that when two solids, one warm, the other cold, approach each other, the latter robs the former of part of its heat, and the temperatures become equal. As to the calling forth of heat by motion; the friction of any two solid substances, such as two hard stones, two pieces of wood, ivory, or metal, produces a heat which often rises to inflammation. The production of heat by combination is no less evident. The union of concentrated acids with water, quicklime, pure alkalis, or metals, is productive of a strong heat: the combination of certain fluids, such as oil of turpentine and nitric acid, is so powerful this way as even to cause inflammation.

The laws respecting the communication of heat were, however, considered as analogous to those of motion, until the labours of Dr. Black of Edinburgh, Dr. Irvine of Glasgow, Dr. Crawford of London, and Kirwan in Ireland, as well as those of many foreign chemists, particularly Mr. Wilcke of Stockholm, and Lavoisier and De la Place of Paris, afforded new and more accurate ideas on this subject. The researches of these excellent philosophers have shown, that nothing was less understood, or involved in greater difficulties, than the progress and communication of heat among bodies unequally heated: but their experiments, though very ingenious, are, probably, not yet sufficiently numerous. It is, however, highly probable that they may lead to the establishment of a general theory, that may extend to all the phenomena of

chemistry; in every one of which heat acts a part, either by its absorption or disengagement.

The nicest and most accurate observations have, however, hitherto been insufficient to afford any determinate or satisfactory notions of the nature of heat; hence both chemists and natural philosophers are still divided in their opinions on the subject. Some follow Lord Bacon and Mr. Boyle, in considering heat as nothing more than a modification of which all natural bodies are susceptible; which has no separate existence but consists in the oscillation of the minute particles of bodies. This was also the opinion of Mr. Macquer. The philophers by whom it has been maintained, support it on the following facts: heat accompanies all the phenomena of motion and appears subject to the same laws: it is increased with the increase of motion, and diminished by its diminution. Excepting its communication or passage from one body into another, in which it follows laws different from those of motion; in all other respects there is a striking analogy between the two; and when this cause acts with less force, or entirely ceases to act, heat is instantly diminished, and soon totally lost. In explanation of this hypothesis, its supporters observe farther, that even bodies of the greatest density are full of small cavities or pores, the sum of which, if they were taken together, would perhaps occupy a larger space than the solid matter of the body that contains them. These void spaces afford room for the particles to move one against another in a continual oscillation. The oscillations are not observed, because both the particles and the pores are so subtle and minute as to elude our senses. In short, the philosophers who regard heat as an internal motion, urge, that no experiment has hitherto demonstrated its existence in a separate state, and that it makes no addition to the gravity of bodies.

But, on the contrary, Dr. Boerhaave, and some other philosophers, as well as many modern chemists, among whom are probably to be reckoned, Dr. Black, Dr. Irvine, and Dr. Crawford, were of opinion, that heat is a particular fluid, diffused through all nature, of which every body contains more or less. They distinguish that fluid as existing in two different states, in combination, and at liberty. In the former state, it neither affects our senses nor the thermometer, but remains quiescent in those bodies of which it constitutes a principle; it is then more or less in a state of confinement. In the decomposition of the bodies it is often disengaged, and escapes into a state of liberty: it now becomes capable of acting on bodies exposed to its influence; and its force is measurable by a graduated thermometer. As all bodies that pass from a solid to a fluid state, and from thence into a vaporous form, excite cold in the surrounding atmosphere, they suspect that such bodies absorb a great quantity of heat; and when fluids, by assuming a concrete form, generate heat, they think that heat is then disengaged from those substances, and passes from a state of combination into a state of liberty.

Heat may therefore, from hence, be distinguished into two kinds, or rather as existing in two different states; in the one, it is intimately combined with other principles, and is denominated *latent heat*, because it is not perceptible to the senses; in the other, it is only diffused without combination. This last kind of heat may be expelled by pressure: thus, when a bar of iron is struck, the stroke compresses its particles, and causes the heat to issue out, in the same manner as water issues from a wet sponge when it is pressed together with the hand. Combined heat cannot be separated from the bodies of which it forms a part, but by means of new chemical combinations.

Both Scheele and Bergman have considered heat as a distinct substance, and the former has examined with great attention all the phenomena which it displays as a chemical agent susceptible of combination. He has even thought himself warranted by his experiments to conclude, that it is a combination of vital air, which he calls *empyreal fire*, and fixed fire or phlogiston, and that it differs from light only in the relative quantity of the last principle. But however ingenious and accurate his experiments may be, the inductions which he has drawn from them concerning the nature and principles of heat do not appear to be naturally deducible from the facts. His analysis of heat cannot therefore be considered as by any means demonstrated to be just. Some philosophers are of opinion, that light and heat are the same substance, only existing in different states. That this substance becomes light, when its particles being collected together, and possessing all their attractive force, are violently darted to a distance. That it assumes the character of heat, when the same particles exist in a state of division, move gently, and tend towards an equilibrium. That heat may be converted into light, and light again into heat. But notwithstanding their similarity in some respects, there are many facts that oppose this opinion. It must be acknowledged, that light often produces effects very different from those of heat; as on the nitric acid, the oxigentated muriatic acid, the oxides or calces of metals, and the leaves of vegetables dipped in water; all of which bodies afford vital air or oxigenous gas when exposed to the rays of the sun, which can be obtained from scarce any of them by the operation of heat. Thus the artificial light of our fires in passing through vessels, changes the nature of the products which it disengages. The French chemists, Mess. Lavoisier and De la Place, seem to think that both the former opinions may be in some degree true: they consi-

der heat as a distinct substance, which by its presence in natural bodies occasions an oscillation of their component particles.

From what has been already observed respecting the nature of heat, it would appear, that, notwithstanding the various hypotheses that have been advanced, there are only two principal opinions entertained concerning it by philosophers in general; one of which is, that heat consists of a peculiar motion or vibration of the parts of bodies, so that the temperature is higher the stronger the vibration: the other, that heat is a substance, or fluid, whose greater or less quantity produces a higher or lower temperature.

Although the nature of heat be not, however, certainly known, the phenomena to which it gives rise in chemical combinations and decompositions are not the less certain on that account, or less worthy of careful observation. It is evident, from a vast variety of facts, that whether a body or a modification, it is of itself liable to no alteration, nor is ever lost; and the consideration of this has induced Messrs. Lavoisier and De la Place to form an axiom or general principle concerning its appearance or disappearance. As this axiom is of great importance, it may not be improper to insert it in this place:

"If in a combination, or in any change of state whatsoever, there be a diminution of free heat, the whole of that heat will again appear when the substances are restored to their former state; and, on the contrary, if in any combination or change of state there be an increase of free heat, this additional heat will disappear when the substances return to their original state."

This principle they generalize still farther, so as to make it extend to all the phenomena of heat; and they then express it in the following manner: "all the variations of heat, whether real or apparent, which any system of bodies can suffer, are reproduced in an inverse order when the system returns to its original state."

2. We shall now proceed to consider what are the *general properties of heat*. In order to afford a more exact idea of the nature of heat, and of the manner of its application in modern chemistry, it may be observed, that when metals or liquids are heated, they suffer a dilation in every direction, are reduced to vapour, and at last become invisible when the most powerful heat is applied to them: that bodies which possess the principle of heat, part with it more or less readily; and if we attentively observe them during the time they are cooling, a slight movement or undulation may be perceived in the surrounding air; an effect which may be compared to the phenomenon exhibited upon the mixture of two liquors of unequal weight and density.

Professor Chaptal, an ingenious French chemist, thinks it difficult to conceive this phenomenon without admitting of a peculiar fluid, which passes first from the body which heats, to that which is heated, combines with the latter, produces the effects which have been mentioned, and afterwards escapes to unite with other bodies, according to its affinities, and the law of equilibrium, to which all bodies tend. This fluid of heat, which is termed caloric by modern chemists, is contained in greater or less quantities in bodies, according to the greater or less degrees of affinity existing between it and them. It may, however, be displaced or disengaged by various means; the principal of which is by the method of affinities: for instance, water poured upon the sulphuric acid expels the heat, and takes its place; and while there is a disengagement of heat, the volume of the mixture does not increase in proportion to the bulk of the two substances mixed. This shows that penetration takes place, which cannot be explained but by admitting that the integrant parts of the water take the place of the caloric, in proportion as it is dissipated. Another method of precipitating caloric, as we have already observed, is by friction and compression, in which case it is expressed or squeezed out of the body. The whole of the heat which may be produced by friction, is not, however, in fact, afforded by the body itself; because, in proportion as the interior heat is developed, the external air acts upon the body, calcines or inflames it, and gives out heat itself during its fixation. Fermentation, and, in general, every operation which changes the nature of bodies, may disengage caloric, because the new compound may demand and receive a greater or less quantity. It is from this cause that chemical operations sometimes produce heat, and sometimes cold.

3. *The forms under which caloric presents itself*, are either a state of liberty, or a state of combination, as already observed: in the former it is not combined in any manner with any other body; but in the latter it is fixed in bodies by affinity, or elective attraction, so as to form part of the substance of the body, and even part of its solidity.

(1.) In the first case, the caloric always endeavours to obtain an equilibrium; not that it is distributed equally among all bodies, but it is dispersed among them according to the degrees of its affinity. Whence it follows, that the circumambient bodies receive and retain a quantity more or less considerable. Metals are easily penetrated by this fluid, and transmit it with equal facility; wood and animal substances receive it to the degree of combustion, and liquids, until they are reduced to vapour. Ice absorbs all the heat communicated to it, without giving it out to other bodies until it has acquired the fluid state.

The power of quickly transmitting heat in the production of a common temperature, is not, how-

ever, the same in different bodies. It may, therefore, be necessary to take notice of this circumstance, and of what has been called the difference of *capacity* for heat in bodies. If a number of straight wires of equal sizes, but different metals, be covered each with a thin coat of wax, and their ends be all plunged in the same heated fluid—for example, melted lead—the fusion of the coat of wax will show that heat is more quickly transmitted through some metals than others. Thus also it is found, that the end of a glass rod may be kept red-hot for a very long time, without any inconvenience to the hand which holds the other end; though a similar metallic rod, heated in the same manner, would very soon become too hot to be held. Bodies that quickly alter their temperature by communication, are said to be better conductors of heat than such as alter more slowly.

It is evident, however, that if two bodies be perfectly equal and alike in all respects, and have the same temperature, they must possess equal quantities of heat; and that generally the quantities of heat in bodies of the same kind, at the same temperature, will be in proportion to their quantities of matter or their weights. If two such equal and similar bodies, that differ in temperature, be brought together, they will, by communication, acquire a common temperature, and their quantities of heat by that means will be rendered equal. The quantities of heat also to be added to or taken from bodies of the same kind, to produce equal changes in their temperature, must be in proportion to their quantities of matter. The changes in the form of bodies by heat, do not seem, however, to depend either upon their density, hardness, or specific gravity. But when two equal bodies of different kinds produce a common temperature by communication, it seldom happens that it proves to be an arithmetical mean between the two original temperatures. In such cases, it is evident, that the heat which was communicated from one to the other, has not altered their temperatures equally, but has raised or lowered that of the one more than it has lowered or raised that of the other. And as the proportion between the number of degrees through which one of two bodies is thus raised, and the other lowered, is found by experiment to be the same, however different the two original temperatures may have been, provided no change of form or chemical combination has been produced in either of them; it is a general consequence, that the quantity of heat required to alter the temperature of one of the bodies a single degree, or any other equal part, will be greater or less than would be required to produce the same change in the other body, in proportion as the changes produced by the communicated heat were less or greater. The whole heat in each body, when they have the same temperature, must consist of the same number of degrees: the proportion between the whole heats of the bodies will therefore be the same as between the heats required to raise each of them a single degree; that is to say, the comparative heats of bodies, at the same temperature, will be in the inverse proportion of the number of degrees their temperature is altered by the same quantity of heat. To illustrate this, suppose a pint of mercury, at the temperature of 136°, be mixed with a pint of water at 50°, the mean temperature will be 76°. The water, therefore, has been heated 26°, and the mercury has been cooled 60°, by the loss of the heat it imparted to the water. The absolute heat in one degree of the mercury will consequently be proportionally less than that of one degree of the water; because the very same heat which has raised the water 26 degrees in temperature, would raise the mercury 60, if it could be returned again: and the whole heat contained in the mercury will be to that of the water in the same proportion of 26 to 60. But in the present experiment equal bulks were used; and mercury is about thirteen times as heavy as water. An equal weight of mercury would contain only one-thirteenth part of the heat. Twenty-six, divided by 13, quotes 2: whence the comparative heats of mercury and water are in the proportion of about 2 to 60, or 1 to 30; that is to say, a pound of mercury, at the same temperature, contains no more than one-thirtieth part of the heat contained in a pound of water. The term *comparative heat* is generally used to denote the proportion of the absolute quantity of heat in one body to that of another equal mass of matter at the same temperature, considered as a standard. The standard made use of is pure water, in a fluid state. By some writers this is called specific heat. The disposition, or property, by which bodies severally require more or less heat to produce equal changes in their temperature, is called their capacity for heat. These capacities are considered as the unknown cause of the differences in their comparative heats, to which they are consequently proportional.

By experiment it has been found, that the capacity of the same body for heat is least when solid, greater when fused or fluid, and greatest of all when it becomes converted into vapour, or elastic fluid. Also, when bodies unite by virtue of chemical attraction, their capacities are seldom the same as the sum of the capacities of the bodies, but almost always either greater or less. It may be proper to notice a few of the consequences of this doctrine. The capacities of ice and fluid water are found to be as nine to ten. Ice cannot, therefore, be converted into water, unless it be supplied with as much heat as is sufficient to answer the difference of capacity. Thus, if equal quantities of ice and water, both at the temperature of 32°, or the freezing point, be exposed in similar

vessels, at the same distance from a fire, both will receive heat alike; and the ice will be melted into water at 32°, while the water in the other vessel will have its temperature raised to 178°. Here it is obvious that the same heat which raised the water 146 degrees, was merely sufficient to supply the increased capacity of the ice; for which reason this last had not its temperature raised at all. If the experiment be more accurately made, by mixing weights of water at 178°, and ice at 32°, the same consequence will follow; for the ice will be melted, and the common temperature will be 32°; because the ice in melting receives no augmentation of temperature, but absorbs the whole 146° of heat from the water, by virtue of its increased capacity when it becomes fluid. It is also the same when water is frozen by the loss of its heat, communicated to a cold atmosphere, or other contiguous bodies; the process of cooling goes on till ice begins to be formed; but, during the whole time of the conversion of water into ice, the temperature remains stationary, because the diminished capacity of the ice causes it to give out heat, the continual evolution of which supplies the refrigerating bodies with as much as their energy of cooling might otherwise have taken to cause a diminution of the temperature. When the whole is frozen, this supply of extricated heat ceases; and therefore the cause that cooled the water at first, goes on in cooling the ice, until the common temperature be produced.

In the various experiments wherein the capacities of the same bodies are changed, and the difference between the quantities of heat in the same body in both states, at one common temperature, is known in degrees of the thermometer, we may derive the advantage of finding the absolute quantities of heat in degrees of the thermometer, or the number of degrees which any particular point or temperature is remote from the true zero, or point of absolute privation of all heat. To illustrate this curious position, the experiments on ice and water, just related, may be made use of. The whole quantities of heat, in these two states, are as nine to ten. It is plain, therefore, that when water freezes, it must give out one-tenth of its whole heat; and this tenth part, by the experiment, is found to answer to 146° of Fahrenheit's thermometer. Consequently its whole heat is ten times 146°, or 1460° of the same thermometer, when its temperature is 32° above zero. Whence the natural zero is at 1428°.

No direct experiment has hitherto been made to show the capacity of steam with relation to water. From an indirect trial of Dr. Crawford's, it appears to be as 15½ to 10. It is accordingly found that steam, in its condensation into water, gives out as much heat as would raise an equal quantity of non-evaporable matter, of the same capacity as water, 914 degrees. This heat it must have taken up at its formation. Whenever water is heated, we may consequently consider the heat as disposed of in two ways. One part raises the temperature of the fluid water, and the other part is employed in supplying the elastic vapour that flies off with the heat which its increased capacity requires at that temperature. The greater the quantity of steam is produced, the larger will be the proportion of the heat employed in this last way. Now, there is a difficulty attends the formation of elastic vapour, in proportion as its escape is rendered more difficult. If the water be heated in a close vessel, no steam will be formed; if the steam escape by a small hole, there will be less formed than if the whole surface of the water were uncovered; and if the superincumbent atmosphere be removed, as in the vacuum of an air-pump, the production will be greatest of all. As the heat of the water goes on increasing, the production of steam will likewise increase, until the quantity be so great as by its augmented capacity to carry off the whole heat that is communicated. At this period the increase of temperature will, therefore, cease, and the temperature will become stationary. This point is called the boiling-water point. It varies, however, a little, as the pressure of the atmosphere varies, being lowest when that is least; because the maximum of steam is produced at a lower temperature when the obstacle to its escape is less. It has been suggested, and with some probability, that there would be no interval of fluidity between the solid and vaporous forms, if if were not for the pressure of the surrounding atmosphere.

The production of cold by evaporation, and the effect of freezing mixtures, may be easily accounted for on this doctrine.

It is only possible to appreciate the degree of heat by its effects. The instruments which have been successively invented to calculate it, are known by the names of thermometers, pyrometers, &c. and these have been applied to the strict determination of the several phenomena exhibited in consequence of the absorption of caloric in various bodies.

The exactness of the correspondence between the degrees of the thermometer, and the actual variations of the heat of fluids, was first accurately determined by M. De Luc. By mixing equal quantities of water at different temperatures, he found that the thermometer very nearly indicated the arithmetical mean between the two temperatures, and consequently that its indications really correspond with the quantities of heat.

The rarefaction or dilatation of fluids, or of metals in the fluid state, by the several degrees of

heat, has been long measured by thermometers formed of glass; but this very fusible substance can only be used to ascertain degrees of heat inferior to that which renders the glass itself fluid. For calculating the higher degrees of heat, several means have been successively proposed. Mr. Leidenfrost has proved, that the hotter a metal is, the more slowly drops of water will evaporate from its surface; and has proposed this principle for the construction of pyrometers. A drop of water in an iron spoon, heated to the degree of boiling water, evaporates in one second; a similar drop, poured on melted lead, is dissipated in six or seven seconds; and upon red-hot iron in thirty. Mr. Ziegler, in his *Specimen de Digestore Papini*, has found that eighty-nine seconds were required to evaporate a drop of water at 520 degrees of Fahrenheit; and that one second is sufficient at the 300th degree. This phenomenon, which is probably more interesting to chemistry than pyrometry, would seem to depend upon the adhesion and decomposition of the water upon the metal.

One of the most ingenious and accurate pyrometers that has hitherto been invented, is that which was presented to the Royal Society by Mr. Wedgewood. It is constructed upon the principle, that the purest clay shrinks in the fire in proportion to the heat applied to it; and consists of two parts, one called the *gauge*, which serves to measure the degrees of diminution or shrinking; the other containing the simple pieces of pure clay, which are called *thermometer pieces*.

At the time of using this instrument, one of the pieces is exposed in the fire-place, the heat of which is to be determined; and when it has acquired the whole intensity, it is taken out, and suffered to cool, or, for greater speed, it is plunged in water; after which it is presented to the gauge, and its degree of contraction easily ascertained.

These different instruments are not, however, applicable to all cases. We cannot, for instance, calculate with strictness the heat which escapes from living bodies, or determine with precision the temperature of any substance. Other methods have, therefore, been invented. By Mr. Wilcke, of Stockholm, it has been proposed to estimate the heats of bodies by observing the quantities of snow they can melt in a given time. But a better method, and an apparatus which is more convenient, has been invented by Lavoisier and De la Place, of Paris. It is constructed upon the principle that ice absorbs all the heat communicated to it, without communicating it to other bodies until the whole is melted; so that in this way may be calculated the degrees of heat communicated, by the quantity of ice which is melted. It was found necessary, in order to afford strict results, to discover the means of causing the ice to absorb all the heat disengaged from the bodies under examination, and to cover it from the action of every other substance which might facilitate its fusion, as well as to collect with great care the water produced by the fusion. The apparatus constructed by these two celebrated chemists for this purpose, is called a *calorimeter*. It consists of three circular vessels nearly inscribed in each other; so that three capacities are produced. The interior space or cavity is formed by an iron grating, upon supports of the same metal, in which the bodies subjected to experiment are deposited; the upper part of it being closed by means of a cover. The middle space, next to this, is intended to contain the ice which surrounds the interior compartment, and which is supported and retained in its place by a grate, on which a cloth is spread. In proportion as the ice dissolves, the water flows through the grate and the cloth, and is collected in a vessel placed below. The external space or compartment of the apparatus contains ice intended to prevent the effect of the heat of the surrounding atmosphere. See Plate VI.

When this useful machine is employed, the middle or second space is filled with pounded ice, and likewise the cover of the internal sphere; the same thing is done with regard to the external space, as well as to the general covering of the whole machine: the interior ice is suffered to drain; and, when it ceases to afford water, the covering of the internal space is raised, to introduce the body upon which the experiment is intended to be made. Immediately after this introduction, the covering is put on, and the whole apparatus remains untouched until the included body has acquired the temperature of thirty-two, or the freezing temperature of water, which is the common temperature of the internal capacity. The quantity of water afforded by the melting of the ice is then weighed; and this is an accurate measure of the heat disengaged from the body, because the fusion of the ice is the effect of this heat only. Experiments of this nature continue a considerable length of time; and it is of great consequence, that there should be no communication between the middle, or second, and the external space of the machine; and also, that the air of the apartment should not be lower than that of the freezing point; because the interior ice would then receive a degree of cold lower than that temperature.

In respect to specific heat, it is proper to observe, that it is merely the proportional quantity of heat necessary to raise bodies of equal mass to the same number of degrees of temperature; so that, when the specific heat of a solid body is required, its temperature must be elevated a certain number of degrees, at which instant it must be placed in the internal sphere, and there left until its temperature is reduced to thirty-two, or the freezing point of Fahrenheit's thermometer. The

water is then collected, and this quantity divided by the product of the mass of the body; and the number of degrees of its original temperature above thirty-two, will be proportional to its specific heat. When fluids are examined, they are inclosed in vessels whose heat has been previously determined. The operation is then the same as for solids; excepting that the quantity of water afforded must be diminished by a deduction of that quantity which has been melted by the heat of the vessel. If it be required to determine the heat which is disengaged during the combination of various substances, they must be all reduced, as well as their containing vessels, to the temperature of thirty-two. The mixture must then be placed in the internal sphere, and the quantity of water collected is the measure of the disengaged heat. In order to determine the heat of combustion and respiration, as the renewal of air is indispensable in these two operations, it is necessary to establish a communication between the internal part of the sphere and the surrounding atmosphere; and in order that the introduction of fresh air may not cause any perceptible error, these experiments ought to be made at a temperature little differing from thirty-two, or at least the air which is introduced, ought previously to be brought to this state of temperature.

With a view to determine the specific heat of gases, it is necessary to establish a current through the internal part of the sphere, and to place two thermometers, one at the place of introduction, and the other at the place of escape. By a comparison of the temperatures exhibited by these two instruments, a judgment is formed of the heat absorbed, and the melted ice is measured.

All the different means made use of for the admeasurement of heat, are founded on the general principle, that different bodies absorb heat in greater or less quantities. If this fact were not already generally admitted, it might be established on the following facts: Dr. Franklin having exposed to the rays of the sun two small pieces of cloth, of the same texture, but of different colours, upon the surface of the snow, perceived, a few hours afterwards, that the red cloth was buried in the snow, while the other, which was white, had not suffered any depression. M. de Saussure has also observed, that the peasants of the mountains of Switzerland are careful to spread a black earth over the surface of grounds covered with snow, when they are desirous of melting it, to sow their seed. So likewise children burn a black hat in the focus of a small lens which would scarcely heat a white one, exposed in the same manner.

(2.) With regard to the phenomena of heat *when it escapes from a state of combination*, it is evident that heat is sometimes disengaged in a state of simple mixture, as in the phenomena of vapours, sublimations, &c. If heat be applied to water, these two fluids will unite, and the mixture will be dissipated in the atmosphere: but it would be an abuse of words to call so weak an union by the name of combination; for, as soon as the heat becomes in a situation to combine with other bodies, it abandons the water, which returns to a liquid state. This body, during evaporation, continually carries with it a portion of heat; and hence, probably, result the advantages of transpiration, perspiration, &c. But heat very frequently contracts a true chemical union, with the bodies which it volatilizes: this combination is even so perfect, that the heat is not perceptible, but is neutralized by the body with which it is combined, in which case it is called *latent heat*, as we have before observed.

The different instances in which heat enters into combination, and passes to the state of *latent heat*, may be reduced to the two following:

First, Every body which passes from the solid to the liquid state, absorbs a portion of heat, which is no longer sensible to the thermometer, but exists in a state of true combination. In proof of this, the academicians of Florence filled a vessel with pounded ice, and plunged a thermometer in it, which descended to thirty-two on Fahrenheit's scale. The vessel was then immersed in boiling water, and the thermometer did not rise during the whole time of the liquefaction of the ice. It is evident, therefore, that the fusion of ice absorbs heat. Mr. Wilcke, of Stockholm, poured a pound of water, heated to the sixtieth degree of Reaumur, upon a pound of ice. The melted mixture possessed the temperature of 0, of the same thermometer. Sixty degrees of heat had therefore entered into combination. The experiments of the chevalier Laudriani have also shown, that, in the fusion, metals, sulphur, phosphorus, alum, nitre, and many other substances, absorb heat.

Cold is produced in the dissolution of all those salts which are accustomed to crystallize. On this subject, Reaumur has made a series of very interesting experiments, which confirm those of Mr. Boyle. Fahrenheit also caused the thermometer to descend very low, by melting ice by strong nitrous acid. But the most extraordinary experiments that have been attempted in this country, are those made by Mr. Walker, apothecary at Oxford, and inserted in the Philosophical Transactions for the year 1787. The mixtures which produced the greatest degrees of cold in these trials, were, 1. Eleven parts of muriate of ammonia, or common sal ammoniac; ten parts of nitrate of potass, or common nitre; sixteen parts of sulphat of soda, or Glauber's salt; with thirty-two parts, by weight, of water: the two first salts should be dry, and in powder. 2. The nitric acid, muriate of ammonia, and sulphat of soda, lowered the thermometer to eight degrees under 0. Mercury has

also been frozen, without using either ice or snow, by the same able experimenter. It is therefore an incontrovertible principle, that all bodies which pass from the solid to the liquid state, absorb heat, and retain it in so accurate a combination as to afford no sign of its presence; in which case it is therefore fixed, neutralized, or latent.

Secondly, All bodies, by passing from the solid or fluid state to the aëriform state, absorb heat, which becomes latent; and it is by virtue of this heat that such bodies are placed and maintained in that state; and on this principle is probably founded the process used in China, India, Persia, and Egypt, to cool liquors used for drink. The water intended for this purpose, is put into very porous vessels, and exposed to the sun, or to a current of warm air, in order to cool the fluid which they contain.

It may also be concluded from the experiments of Mr. Richmann, which have been inserted in the first volume of the Imperial Academy of Petersburg; that a thermometer taken out of water, and exposed to the air, always descends, even when its temperature is equal or superior to that of the water; that it afterwards rises, until it has acquired the temperature of the atmosphere; that the time of descending is less than that which it employs to rise again; and that when the thermometer, withdrawn from the water, has arisen to the common temperature, its bulb is dry; but that it continues wet during the whole time of its standing beneath this common temperature. To these consequences may be added others, deduced from several curious experiments made by the celebrated Dr. Cullen. 1. That a thermometer suspended in the receiver of the air-pump, descends two or three degrees during the time of exhaustion, and afterwards rises to the temperature of the vacuum. 2. That a thermometer plunged in alkohol, in the receiver of the air-pump, always descends, and the lower in proportion as the bubbles are stronger which issue from the alkohol; if it be withdrawn from this liquor, and suspended wet beneath the receiver, it falls eight or ten degrees while the air is pumping out. It is also well known, that if the ball of a thermometer be wrapped in fine linen, and kept moist by sprinkling with ether, and the evaporation be facilitated by agitation in the air, the thermometer will descend to the freezing point.

From this it is plain, that the heat which has entered into combinations with bodies during their transition from the solid to the liquid state, or from this last to the aëriform state, may be again exhibited by causing these substances to return again to the states of liquefaction or solidity. In a word, every substance which passes from the liquid to the solid state, suffers its latent heat to escape, which at this instant becomes free or thermometrical heat. The celebrated Fahrenheit, having left water exposed to a colder temperature than that of ice, the water remained fluid: but it congealed by agitation; and the thermometer, which marked several degrees beneath the freezing point, suddenly rose to that temperature. Facts of a similar nature have also been mentioned by other writers.

It has been shown by Mr. Baumé, in his inquiries and experiments relating to several singular phenomena exhibited by water at the instant of its congelation, that several degrees of heat are always developed at that instant. Gaseous substances are maintained in the aëriform state merely by the heat which is combined with them; and when to these substances, thus dissolved in caloric, another body is presented, to which they have a very strong affinity, they abandon their heat to unite with this last substance; and the caloric, thus expelled or disengaged, appears under the form of free or thermometrical heat. This disengagement of heat, by the concretion or fixation of gaseous substances, was observed by the celebrated Scheele, as is evident from the valuable experiments which form the basis of his Treatise on Air and Fire. Since the time of this excellent chemist, rigorous calculations have been made of the quantity of latent heat existing in different gases. The researches of Dr. Black, Dr. Crawford, Mr. Wilcke, Mr. De la Place, and Mr. Lavoisier, on this subject, are all of them highly deserving of the attention of the chemical inquirer. Nor are the recent discoveries of that excellent philosopher and benefactor to mankind, Count Rumford, to be overlooked. For, though these form only parts of an unsettled theory, they are at least splendid facts on which to build future generalisations of the highest importance. For the account of his curious discoveries respecting the communication and radiation of heat, as not being directly within the scope of our work, we refer to his own publications, and to the Philosophical Transactions of late years.

CALORI'METER; an instrument by which the whole quantity of absolute heat existing in a body in chemical union can be ascertained. See Caloric, and Pl. VI.

CA'LTHA PALU'STRIS; the marsh marigold. The young buds of this plant make, when properly pickled, very good substitutes for capers.

CA'LTHA VULGA'RIS. See Calendula.

CA'LTROPS; a name of several species of potamogeton.

CALVA'RIA, (from *calvus*, bald; because that part of the head first becomes bald); the superior portion of the cranium, usually sawed off, to expose the brain.

CALX; the old name for what is now termed an oxid. It is applied in chemistry to denote any thing that is rendered reducible to powder, by burning in contact with air. The term calx is also applied to lime. See Lime.

CALX. See LIME, and CALX VIVA.

CALX ANTIMONII. See ANTIMONIUM CALCINATUM.

CALX CUM KALI PURO, called also *lapis septicus*, *cauterium potentiale*, *causticum salinum*, and *causticum commune fortius*. The preparation thus called in the pharmacopœias, is termed *potassa fusa* in the new chemical nomenclature. It is highly corrosive and caustic, destroying the vitality of flesh with great activity. It is employed by surgeons as a caustic in a variety of instances. The colleges of London, Edinburgh, and Dublin, direct this remedy in the following way:

Calx cum Kali Puro. Lond.

Take of Quicklime, five pounds and four ounces;
Water of pure kali, sixteen pounds.

Boil away the water of pure kali to a fourth part; then sprinkle in the lime, reduced to powder by the affusion of water. Keep it in a vessel closely stopped.

Potassa cum Calce. Edin.

Take of solution of potass, any quantity.

Evaporate in a covered iron vessel till one third remains; then mix with it as much new-slaked lime as will bring it to the consistence of pretty solid pap, which is to be kept in a vessel closely stopped.

Causticum Mitius. Dubl.

Evaporate caustic ley to one third, then add powdered lime till it become thick, and form it into proper masses.

The addition of the lime in these preparations renders them less apt to deliquesce. They are also more easily managed, and milder in their operation.

CALX HYDRARGYRI ALBA, or *mercurius præcipitatus albus*; or *cosmeticus*; white præcipitate of mercury. This mercurial preparation is an ammoniacal muriate of quicksilver, and therefore termed *murias hydrargyri ammoniacalis* in the new chemical nomenclature.

[*Calx Hydrargyri Alba.* Lond.

Take of Muriated quicksilver,
Sal ammoniac,
Water of prepared kali, of each half a pound.

Dissolve first the sal ammoniac, afterwards the muriated quicksilver, in distilled water, and add to these the water of prepared kali. Lastly, wash the powder until it become insipid.

When, to a solution of muriate of ammonia, we add muriate of quicksilver, about thirty times more of the latter will be dissolved than the same quantity of pure water is capable of taking up; and the solution is attended with a considerable increase of temperature. Now, Dr. A. Duncan observes, that, as these facts sufficiently prove a reciprocal action of the two salts, and there is no decomposition, it is evident that they must have combined to form a triple salt; especially as they cannot be again separated either by sublimation or crystallization. This compound, he thinks, may therefore, with propriety, be termed *muriate of mercury and ammonia*. It is the *sal alembroth* of the alchemists. It is very soluble in water, and sublimes by heat without decomposition. When, to a solution of this salt, we add a solution of an alkaline carbonate, there occurs a partial decomposition. The alkali combines with a portion of the muriatic acid; and reduces the muriate of mercury and ammonia to the state of a sub-muriate, which, being insoluble, falls to the bottom of the solution.

The sub-muriate of mercury and ammonia thus precipitated, has at first an earthy and afterwards a metallic or brassy taste. It is not soluble in water. It is decomposed by heat; furnishing water, ammonia, and nitrogen gas, while 0.86 of sub-muriate of mercury remains behind. The sulphuric and nitric acids partially decompose it, and convert it into muriate of mercury, and triple salts of mercury and ammonia. Muriatic acid dissolves it, and converts it into muriate of quicksilver and ammonia. According to Fourcroy's analysis, it consists of the following proportions:

81	oxid of mercury,
16	muriatic acid,
3	ammonia.
100	

Dr. Duncan observes, if the analysis of the different muriates be correct, that there is an unnecessary want of economy in using equal parts of muriate of ammonia and muriate of mercury; for by calcination, at least, we should employ only one part of the former to eight of the latter.

It is only used as a topical remedy, and generally in the form of an ointment.

Unguentum Calcis Hydrargyri Albæ. Lond.

Take of White calx of quicksilver, one drachm;
Ointment of hog's lard, one ounce and a half.

Mix, and make an ointment.

This is a very elegant mercurial ointment, and

frequently made use of in the cure of psora and other cutaneous affections.

CALX VIVA, also called *calx usta*, *lapis seu terra calcarea usta*, or *calx pura;* QUICK-LIME. This is called *calx* in the new chemical nomenclature, the crude or aerated or unslaked being a carbonate. Lime and its combinations are spoken of under the article LIME. Quick-lime possesses caustic, depilatory, and antacid qualities. Externally, joined with potass, it is applied as a powerful caustic, See CALX CUM KALI PURO. The only preparation of it exhibited internally, is the *aqua calcis*, which is administered in cardialgia; spasms, diarrhœa, and infantile convulsions, from acidity in the primæ viæ; rickets, some diseases of the skin, stone in the kidney or urinary bladder: joined with cold drawn linseed oil, it is a good application to burns (see BURNS); and it is often employed by surgeons as an injection or wash for certain species of ulcers.

The officinal preparations into which lime enters, are: Aqua calcis, *Edin. Lond. Dubl.* Aqua potassæ, *Edin. Lond. Dubl.* Aqua ammoniæ, *Edin. Lond. Dubl.*

CALYCA'NTHEMÆ, (from *calyx*, the flower-cup; and ανθος, the *flower)*, the name of the seventeenth order in Linnæus's Fragments of a Natural Method. This order consists of plants, which, among other characters, have the corolla and stamina inserted into the calyx. The genera contained in this natural order are: 1. Plants having the *receptacle of the flower placed upon the fruit.* The Linnæan genera are: *epilobium*, willow-herb, or French willow; *gaura*, Virginian loose-strife; *isnardia; jussiœa; ludvigia; melastoma*, American gooseberry-tree; *mentzelia; oenothera*, tree primrose. 2. Plants having the *fruit placed upon the receptacle of the flower:* as in the *ammannia; frankenia; glaux*, sea chickweed, and black saltwort; *grislea; lythrum*, willow-herb, or purple loose-strife; *osbeckia; peplis*, water purslane; *rhexia.*

For an account of the habit and structure of the plants of the order calycanthemæ, see Milne's Bot. Dict. article CALYCANTHEMÆ.

CALYCA'NTHUS, Carolinian all-spice; a genus in Linnæus's botany. He enumerates two species.

CALYCIFLO'RÆ, (from *calyx*, the flower-cup, and *flos*, the flower); the sixteenth order in Linnæus's Fragments of a Natural Method, consisting of plants which, as the title imports, have the stamina (the flower) inserted into the calyx. This order differs from the *calycanthemæ*, which has a title of the same import, in the following particulars: 1. The plants of this order want the corolla. 2. With respect to their sex, the flowers are either hermaphrodite and male upon the same root, *polygamia;* or male and female upon different roots. 3. The seed-vessel is pulpy, of the berry or cherry-kind, and contains a single seed or stone.

This order contains but four genera: viz. *elæagnus*, oleaster, or wild olive; *hippophae*, bastard rhamnus, or seed buckthorn; *osyris*, poet's cassia; *trophis.* The last of these genera is only to be found in the improved editions of the Fragments of a Natural Method.

Calycifloræ is likewise the name of the eleventh class in Royen's Natural Method; and of the forty-eighth order in Lud. Gerard's Arrangement of the Plants that are natives of Provence, in France. In Royen's Method it is a very extensive class, comprehending all plants which have the filaments of the *stamina* inserted into the *perianthium.* Dr. Milne observes, that it exactly corresponds to the class *floribundi*, in Linnæus's Methodus Calycina; and, besides the class *icosandria*, in the sexual method, includes the orders *calycanthemæ* and *calycifloræ.* In Gerard's Method, the order *calycifloræ* is the same as in Linnæus.

CALYCI'NI, (from *calyx*, the flower-cup); the name of the sixteenth class in Wachendorffius's Natural Method of classification. It consists of plants with visible flowers, which have a flower-cup, and whose seeds are furnished with a single *cotyledon.* See COTYLEDON. It is exemplified in the rush, eriophorum, and in cynomorium.

CALYCI'STÆ, (from *calyx*, the flower-cup.) Linnæus applies this term to those systematic botanists who have arranged all vegetables from the different species, structure, and other circumstances of the *calyx.* The only systems of this kind are Character Plantarum Novus, a posthumous work of Magnolius, professor of botany at Montpelier, published in 1720; and Linnæus's Methodus Calycina, published in his *Classes Plantarum*, at Leyden, in 1738. By the internal calyx, in Magnolius's Method, the pericarpium, or seed-vessel, is to be understood.

CALY'PTRA, (from καλυπτω, *to cover);* in botany, a veil, or covering. This term is applied to one of the seven species of calyx, enumerated in the Philosophia Botanica, and defined to be the proper calyx of the mosses. It is placed over the antheræ, and in figure resembles an extinguisher, hood, or monk's cowl. See MUSCI. The term *calyptra* was first used in this sense by Dillenius, to whom we owe many of the principal discoveries in the moss, mushroom, and lichen tribes.

The calyptra bears these epithets: it is either, 1. *Acuminata*, pointed, as in *mnium* and *bryum.* 2. *Caduca*, falling off early, and before the bursting of the antheræ, as in *buxbaumia.* 3. *Conica*, of a conic form, as in most of the mosses. 4. *Glabra*, smooth and shining, as in *hypnum.* 5. *Lævis*, polished, i. e. without any inequalities, as

in *splachnum*. 6. *Oblonga*, of an oblong figure, as in *minium*. 7. *Villosa*, hairy or shaggy, as in golden maiden-hair, *polytrichum*.

In some genera, as lycopodium, porella, sphagnum, and phascum, the calyptra is not found.

By Tournefort, and former botanists, this term was used to denote the proper exterior covering of the seed, which falls off spontaneously. See Arillus.

CALYPTRA'TI, (from *calyptra*); the name of one of the principal divisions in Dillenius's Arrangement of the Mosses; containing such of those imperfect plants as are furnished with the calyptra. See Calyptra. This class is exemplified in water-moss, *fontinalis*; and golden maiden-hair, *polytrichum*. It stands opposed to the class or division *calyptra destituti*, or mosses wanting the calyptra, of the same author. See Musci.

CALYX, (καλυξ, from καλυπτω, *to cover;*) in botany, the outer covering of the flower, commonly called the flower-cup, which, in the greater number of plants, incloses and supports the bottom of the corolla. See Corolla. Linnæus describes it to be the termination of the *cortical epidermis*, or outer bark of the plant, which, after accompanying the trunk, or stem, through all its branches, breaks out with the flower, and is present in the fructification, in this new form.

Dr. Milne disapproves of this definition, which, he says, contains neither the description nor use of the part in question: and he opposes to it the opinion of Dr. Grew, a very learned naturalist of the last century, who, in his *Anatomy of Plants*, thus expresses himself, with regard to the origin of the flower-cup: "The impalement (calyx), whether of one or more pieces, I call that which is the outmost part of the flower, encompassing the other two; viz. the foliation (corolla of Linnæus), and the attire (stamina and pistillum). It is compounded of the three general parts, the skin, the cortical, and ligneous bodies; as is evident from the artichoke, in which the continuation of all these parts is clearly discoverable; the empalers being of that amplitude as fairly to show them all." P. 35.

By former botanists, the term calyx is always used in the proper and restricted sense, and corresponds, therefore, to what is denominated perianthium by modern botanists.

Linnæus, however, employs this with much more latitude, as a general term, comprehending in it the seven following species: 1. Perianthium, which is the *calyx* of Tournefort and others. 2. Involucrum. 3. Amentum, the *julus* of Tournefort. 4. Spatha. 5. Gluma, the *locusta* of Ray. 6. Calyptra. 7. Volva.

These different appellations of the calyx, for Dr. Milne contends that they are no other, depend upon circumstances, which he explains under their several heads, in his Botanical Dictionary. Of the above species, the first, *perianthium*, is by much the most common; an *involucrum*, is almost peculiar to umbelliferous flowers; *gluma*, to the grasses; *amentum*, to another order of plants; *calyptra*, to mosses; and *volva*, to mushrooms. When we speak, therefore, of the proportion, figure, situation, or singularities of the calyx, we always mean, that species of calyx called perianthium. The other species, which differ greatly both in appearance and structure from the first, are denominated by their own proper names; that no confusion, amidst such a diversity of terms, may arise.

The term calyx then, being a general one, and used, even when employed as a particular species, to denote the perianthium, it appears proper to refer to that head the structure and singularities of this first part of the fructification. See Perianthium.

CA'MARA, the fornix of the brain; also the vaulted part of the auricle, leading to the external foramen. It is also the name of a species of lantana.

CAMARO'SIS, (καμαρωσις, from καμαρα, *a tortoise;* also an arched roof). A fracture of the skull, which appeared like the arch of a vault, is thus named in ancient writings.

CAMA'RUM, a species of shrimp of the crab kind; also, in botany, a species of aconitum.

CAMBO'GIA GUTTA. See Gambogia.

CAMBRIAN EARTH; *terra cambria*, or *terra Sydneia australis;* austral earth. It is a peculiar earth, discovered by Mr. Wedgewood, and applied by him to the purposes of manufacture.

CAMBU'I; the wild American myrtle of Piso and Maregrave.

CAME'LLIA, china rose; a genus in Linnæus's botany. There is one species.

CAMEL'S HAY. See Juncus odoratus.

CAMERA'RIA; a genus in Linnæus's botany. He enumerates two species.

CA'MMARUM, the violet-coloured aconite; a species of Aconitum.

CAMOCLA'DIA, a genus in Linnæus's botany. He enumerates two species.

CAMOMILE. See Chamæmelum.

CAMOMILE, STINKING. See Cotula fœtida.

CAMPANA'CEÆ, (from *campana*, a bell); in botany, bell-shaped flowers. The twenty-ninth order, in Linnæus's Fragments of a Natural Method are so called. The following is a list of the genera contained in this natural order:

1. *Bell-shaped flowers, with* distinct antheræ.—*Campanula*, bell-flower; *convolvulus*, bindweed; *evolvulus; ipomoea*, quamoclit, or scarlet convolvulus; *phyteuma*, rampions; *polemonium*, Greek valerian, or Jacob's ladder; *roëlla; Trachelium*, blue umbelliferous throatwort.

2. *Bell-shaped flowers with* Antheræ united into

a cylinder, (syngenesia) :—*Jasione*, rampions with scabious heads, or sheep-scabious; *lobelia*, cardinal flower; *viola*, violet, or heart's-easc.

The plants of this natural order are generally herbaceous, and perennial. Some of the bell-flowers and bindweeds are annual; and a few foreign species of the latter have woody stalks.

Campanaceæ, is likewise the forty-ninth class in Ludov. Gerard's arrangement of the plants that are natives of Provence, in France; consisting of the following genera,—*campanula*, *phyteuma*, *jasione*, and *samolus*.

CAMPANIFO'RMES, (from *campana*, a bell; and *forma*, a figure), in botany, the name of the first class in Tournefort's method of classification. This class consists of herbs and under-shrubs which have a simple flower, with a monopetalous corolla in the shape of a bell, or bason. See COROLLA. This class, Tournefort subdivides into seven sections or orders, from the situation of the *germen*, and nature of the fruit. He includes in it mandrake; deadly night-shade, *atropa;* lily of the valley, *convallaria;* butcher's-broom; honey-wort; gentian; water-leaf; soldanella; convolvulus; dodder, *cuscuta;* burning thorny-plant, *euphorbia;* cassava, *jatropha;* *glaux;* wood-sorrel, *oxalis;* rhubarb, *rheum;* navel-wort, *cotyledon;* dog's-bane, *apocynum;* Virginian silk, *periploca;* swallow-wort, *asclepias;* mallow; marsh-mallow; bastard-mallow; *lavatera;* Indian-mallow, *sida;* althæa frutex, *hibiscus;* cotton, *gossypium;* bryony, *tamus;* single-seeded cucumber, *sicyos;* male balsam apple, *momordica;* cucumber; gourd; bell-flower; rampions; cross-wort, *valantia;* madder; and ladies bed-straw, *galium;* are the bell-shaped flowers of Tournefort.

Campaniformes, is likewise the name of the sixth and twenty-third classes in Pontedera's system, consisting of herbs and trees having bell-shaped flowers.

CAMPA'NULA, bell-flower; a genus in Linnæus's botany. He enumerates sixty-six species.

CA'MPE, (καμπὴ, from καμπτω, *to bend*); a flexure or bending. It is used for the ham; and also, for other articulations.

CAMPEACHY WOOD. See LIGNUM CAMPECHENSE.

CAMPECHE'NSE LIGNUM. See LIGNUM CAMPECHENSE.

CAMPHIRE. See CAMPHORA.

CA'MPHOR. See CAMPHORA.

CA'MPHORA, (*camphura*, Arab.); CAMPHOR or *camphire*. The tree from which this substance is obtained is the *laurus camphora; foliis triplinerviis lanceolato-ovatis*, Linn. Class, *Enneandria;* Order, *Monogynia;* indigenous to Japan, where it grows abundantly. See LAURUS CAMPHORA. Crude camphor, exported from Japan, appears in small grayish pieces, and is intermixed with various extraneous matters: in this state it is received by the Dutch, and purified by a second sublimation; it is then formed into loaves, in which state it is sent to England. Pure camphor is white, pellucid, somewhat unctuous to the touch; of a bitterish, aromatic, acrid taste, yet accompanied with a sense of coolness; of a fragrant smell, and approaching to that of rosemary, but much stronger. It is totally volatile and inflammable, soluble in vinous spirits, oils, and the mineral acids; not in water, fixed nor volatile alkaline liquors, nor in acids of the vegetable kingdom. The use of this important medicine, in different diseases, is very considerable, for which reason we shall examine its properties somewhat in detail.

Dr. Cullen considers the account of camphor, as a medicine, to be a difficult task; as it is necessary for him to encounter the various and contradictory opinions that have been maintained with respect to it. This opposition of opinions indeed appears strongly from the circumstance of the controversy having been brought to the single question, whether camphor be a *heating* or a *cooling* medicine? or, as the Doctor would put it in other words, whether it is a *stimulant* or a *sedative?*

He remarks, in the first place, that camphor, taken into the mouth, is of an acrid taste; and though, by its evaporation, it excites a sense of cold, what remains is a sense of heat in the mouth and fauces: and when taken down into the stomach, it often gives uneasiness, which may be imputed to the operation of its acrimony upon the upper orifice of that organ. These are considered as marks of its heating quality; which is more strongly evinced by its application to any ulcerated part, which it always irritates.

"These are indeed," says Dr. Cullen, "marks of a stimulant power; but hardly any thing corresponding to these appears upon its being thrown into the stomach of man or brute animals. It appears that in the stomach of animals it operates there by a small portion of its effluvia; for when a mass of any bulk has been thrown in, though it has produced considerable effects upon the body, neither the bulk nor weight of what had been thrown in are found to be sensibly diminished: and in such cases it cannot be doubted that the operation has been entirely upon the nerves of the stomach, and by these on the rest of the system. This operation seems to me to be entirely that of a sedative power; and we take its being of that kind on the stomach itself, which occasions the indigestion of the food which has been constantly observed to follow its exhibition in any large quantity.

"The sedative effects, however, are still more evident and considerable in the sensorium. The death of so many animals, suddenly occasioned by it, in the experiments of Menghin, can be explained in no other way but by the power of this sub-

stance, like that of other poisons, in destroying the mobility of the nervous power, and thereby extinguishing the vital principle. It is in illustration of this that it so often operates by first inducing stupor and sleep; and the other symptoms of delirium, furor, and convulsions, can all be probably explained, as we have done with respect to other poisons, by the struggle that occurs between the force of the sedative power and the reaction of the system."

The Doctor here stops to enquire what are the effects of camphor on the sanguiferous system. And here at least he ventures to assert that it shows, in the first instance, no stimulant power. He very much regrets, that, in the account of the experiments made on brutes by exhibiting camphor to them, there is no mention of the state of their pulse. The experiments of Hoffman, however, assure us, that the pulse was not rendered more frequent, or the skin warmer, by twenty grains and upwards of camphor being taken into the human stomach. Indeed, the experiments of Griffin and Alexander rather show, that the frequency of the pulse was diminished by large doses of camphor. To these we may add the experiments of Berger, Werlhoff, Lassone, Home, and those of Collin, which more particularly merit our regard.

The writer last mentioned, in giving some hundred instances of the exhibition of camphor in large doses, even to the quantity of half an ounce in the course of one day, has not, *in any one instance*, *taken notice of the frequency of the pulse*, *or of the heat of the body being increased by it.* In the case in which half an ounce of camphor had been exhibited, the patient was examined by Van Swieten, and some other physicians, who, it may be supposed, could not fail to have noticed its heating the body, if any such effect had appeared. Dr. Cullen himself frequently gave twenty grains, without ever finding the frequency of the pulse increased by it, and sometimes the number of strokes was manifestly diminished.

"I once" says he, "had a maniacal patient, a young woman between twenty-five and thirty years of age, whom I was resolved to try the cure of by camphor; and beginning by five grains for a dose, and increasing it by the same quantity every evening, I brought it at length to a dose of thirty grains; and that dose, in imitation of Dr. Kinnear, I repeated for four nights together. During all this I never found the frequency of the pulse increased; and when the larger doses were employed, the pulse was frequently brought to be ten strokes fewer in a minute than it had been before. At the same time, so little change was made in the state of the mania, that I was resolved to give up the trial; but the apothecary, by a gross error in Baddam's abridgement of the Philosophical Transactions, was led to think that I had mistaken Dr. Kinnear's practice, and had not carried the dose of camphor so far as he had done. Proceeding upon this supposition, he presumed to give forty grains of camphor for the next night's dose. In about half an hour after this had been exhibited, I was sent for to see my patient; who, after beating upon her breast, as if she had felt some uneasiness there, had fallen down seemingly in a state of syncope. She appeared to me quite insensible, with her pulse very weak and hardly to be felt, and her breathing hardly to be observed, with a paleness and coldness over her whole body. I judged her to be dying; but by holding some volatile spirits to her nose, and chafing her extremities with warm flannels, she was so far recovered as to swallow a little warm milk, and afterwards a little warm wine; and by these measures continued for two or three hours, her pulse and the heat of her body were a good deal recovered, and she had the appearance of being in a sleep, in which she was allowed to continue till morning, when she came out of it by degrees, with her pulse very much in its natural state. At the same time the mania was also in the same state as before, and continued to be so for some months afterwards, when I ceased to enquire after her."

Hoffman relates the history of a person who, by mistake, took at one dose two scruples of camphor, which occasioned violent disorder; but the operation was at first like that in the case abovementioned, a weakness and paleness of the whole body, which evidently showed a sedative operation, and not by any means that of a stimulant. In a word, from many experiments, directly to this point, Dr. Cullen says he shall be much surprised *if any body shall deny the sedative and assert the stimulant power of camphor;* notwithstanding the assertions of Quarin, who gives the following account of the effects of this remedy: "*Vidi enim*," says he, "*in multis*, *quibus camphora majori dosi exhibita fuit*, *pulsum celerrimum*, *faciem ruberrimam*, *oculos torvos*, *inflammatos*, *convulsiones et phrenitidem lethalem secutam fuisse*."

But all observers are liable to some uncertainty and ambiguity in these matters. Dr. Cullen is well persuaded, that, in the case of all poisons which do not immediately and entirely extinguish the powers of life, there is *a reaction of the system* which has a tendency to resist and to overcome the power of the poison; and that this reaction operates in various ways, sometimes in exciting the action of the heart and arteries, producing fever; sometimes in exciting the energy of the brain, and producing convulsions; and probably in other ways clearly perceived or capable of being explained. "But," says the author, "it is enough that such a power exists, and that its effects are often so mixed with those of the poison, as to render it difficult, in most cases, to determine what are the effects of the

one or of the other, and has certainly occasioned many phenomena to be imputed to the direct action of the poison, which are, however, purely the effects of the reaction abovementioned.

"We do not, however, venture upon assigning these effects more particularly, as I perceive that they are greatly diversified, according to a variety of circumstances; as, 1. the power and activity of the poison; 2. the quantity of it, and as it has been more or less suddenly introduced; 3. the size of the animal to which it is applied; 4. the constitution of the animal, as more or less powerful in reaction; and 5. according to the time which has been allowed for the operation of these circumstances. This will perhaps remove some of those difficulties which might otherwise have occurred.

"It particularly might be alleged in favour of the advocates for the stimulant power of camphor, that, in these animals which have been killed by it, many of the viscera have been found in a very inflamed state; but I cannot allow this to have been the *direct* effects of the camphor; for there are no instances of this inflamed state appearing in the animals killed *soon after* the taking in of the poison.

"The suddenness of the death, in many cases, occasioned by a direct action on the nervous system, allows of no supposition of previous inflammation; and the sudden recoveries which have sometimes happened after very large doses, assure us, that in such cases no inflammation had been formed in any part of the body. It seems therefore certain, that inflammation is not the direct operation of this substance, and that the inflammation sometimes found, as abovementioned, must be imputed to that agitation of the system produced by the conflict that had subsisted for some time between the powers of the poison and of the reaction.

"It is true that camphor shows a stimulant power in parts of great sensibility, as in the mouth, in the upper orifice of the stomach, and in ulcers where the nerves are laid bare; but there is no proof of its taking place in any other part of the system: and how little it is disposed to operate in this manner, we may judge from hence, that, when rubbed upon the skin in the most concentrated state, it produces no redness or other mark of inflammatory action there; and, as we shall soon have occasion to observe, it has a special power in taking off the inflammatory state of the subjacent parts."

After having thus ascertained the operation of camphor in general upon the human body, and endeavoured to correct the prevailing opinion as to its calefacient power, which he thinks has, on many occasions, perverted the practice, Dr. Cullen next enquires what are the diseases to which it is more especially a remedy. In doing this, he finds it difficult to repeat after practical writers, both on account of their different opinions with respect to the general operation, and with respect to the pathology of the diseases in which they employed this medicine, as these different opinions very much affect their reports.

"Camphor," says he, "has been much employed in fevers of all kinds, particularly in nervous fevers attended with delirium and watchfulness; and in such I have frequently employed it with advantage. Some time ago, I have often seen it employed by my fellow-practitioners in such cases: and that the good effects of it did not always appear, I imputed to its being used only in small quantities. Since we came into the free use of wine and opium, camphor has been little employed here in medical practice. The use of it, however, has been very fully established by some of the most eminent physicians on the continent; among whom is the late learned and experienced Werlhoff, who employed it in many inflammatory diseases with great benefit, and plainly gives his opinion in favour of its *refrigerant* power.

"The use of this medicine has been especially remarkable in putrid fevers, of which indeed we have not many instances in this country: but from the very remarkable antiseptic powers which it discovers in experiments out of the body, it is very probable, that, when thrown into the body in large quantities, so that at least its more subtile parts may be diffused over the whole system, it may be expected to produce considerable antiseptic effects. Its power in resisting and curing gangrene in the experiments of Dr. Collin, are very remarkable; but whether that power be owing to its antiseptic virtue alone, or to its operation at the same time on the nervous system, I would not rashly determine.

"Both from its use in typhoid fevers, and from its known antiseptic powers, it is highly probable that it has been of great service in cases of the confluent small-pox. It is also likely that it may be of service in favouring the eruption of exanthemata, and of bringing them back to the skin, when from any cause they had suddenly receded, though I have no particular experience of this."

These are the instances of acute disease in which Dr. Cullen supposes camphor has been useful; and its use, he says, in many chronic cases is equally well authenticated. Thus, whenever diseases depend upon a mobility of the nervous power, and an irregularity of its motions, it may be expected that such a powerful sedative should be of service; and accordingly, many practitioners have justly reported its virtues in hysteric and hypochondriac cases.

In convulsions, and in spasmodic affections, it has also been found of service; and even in the epilepsy. Dr. Cullen, though he never knew an epilepsy entirely cured by *camphor alone*, had several instances of a paroxysm which was expected in the course of a night, prevented by a dose

of camphor exhibited at bed-time; and even this when the camphor was given alone: but, he says, it has been especially useful when given with a dose of the cuprum ammoniacum, of vitriolated zinc, or of the flowers of zinc.

Since the appearance of Dr. Kinnear's paper, in the Philosophical Transactions, (Vol. xxxv.), camphor has been often employed in cases of mania; but in Dr. Cullen's account of the trial which he made of it, it was not successful; nor, in several other trials, does it appear to have succeeded better with other practitioners. For farther remarks, however, on this head see the article MANIA.

Several physicians having employed camphor in the most acute inflammatory diseases, it is not surprising that it has been given also internally in the acute rheumatism. This, though said to have been advantageous, Dr. Cullen professes to have had no experience of, because he found other methods of cure that were generally successful; however, he mentions its external use, as an eligible means of removing rheumatic pains in the joints or muscles. This, he says he often experienced, and has no doubt of camphor having a peculiar power in taking off the inflammatory state both in rheumatism and gout. In the case of rheumatism it is certainly a matter of common experience: in the case of gout it is more rare, but a particular example of it occurred in the case of a gentleman who had brought from the East Indies some of the oil of camphor. See OLEUM CAMPHORÆ.

This case shows evidently the power of camphor in relieving the inflammatory spasm and pain of the part, but at the same time it has no effect on the diathesis of the system; and it also appears when that subsists, that camphor is apt to occasion a translation, and will therefore always be employed in gouty cases with great danger. In cases of acute rheumatism even, a strong solution of camphor in oil, though it has relieved the pain of the joint for the time, has very often been attended with the translation of it to another joint soon after. For this reason, Dr. Cullen ceased from employing camphor externally, in all cases where a disposition to acute rheumatism was very general and strong in the system.

It is perhaps to this power which camphor has of taking off an inflammatory state, that we are to attribute the good effects of this medicine in the tooth-ach; but it also acts materially by exciting a copious flow of saliva and mucus from the internal surface of the mouth. Hence it is that water somewhat impregnated with camphor, has been employed to wash the mouth, and has frequently proved of service.

Another disease, in which we can have little doubt that the antiphlogistic nature of camphor may be useful, is the ophthalmia: and this affords sufficient ground for approving of the many attempts that are made to introduce it into the medicines employed externally in the cure of inflamed eyes. Perhaps the best, as being certainly the least irritating, mode of applying it, is by fumigation: a lump of camphor being thrown into boiling hot water, or vinegar, the patient may direct the particles of camphor that arise, by means of an inverted funnel, to the affected organ, and can thus regulate the strength of the application by his own feelings.

Having mentioned many of the virtues of camphor as employed by itself, some instances may be given of its peculiar utility when combined with other medicines.

When combined with drastic purgatives, it is said to moderate their acrimony, and consequently to restrain their violent operation on the intestines. Dr. Cullen, though he had not perceived this, perhaps never having tried it in a proper manner, is nevertheless satisfied of the fact, on the respectable authority of the elder Lasonne.

That camphor has the power of correcting the acrimony of cantharides is a fact very generally believed; and in opposition to this, the Dr. is not inclined to quote the facts given by Dr. Heberden of two instances in which this remedy seemed to occasion strangury: for these he considers to have been mere accidental occurrences, as he employed camphor frequently, in large doses, without ever observing that it had any effect upon the urinary passages. Mr. Lasonne also says, that camphor, though given very largely, never discovers its smell in the urine, though it frequently does in the perspiration.

It was formerly a frequent practice in Britain to anoint a blistering plaster that was to be applied to the back, or other part, with camphorated oil, and this with a view of preventing strangury from the absorption of the cantharides. The practice however has been long ago laid aside, because it was perceived, that, in most persons, if the plaster was allowed to continue on them for above twelve hours, and while at the same time it was omitted to give the patient a large quantity of drink, a strangury would come on notwithstanding the unction of camphorated oil, and even the exhibition of a quantity of camphor internally. Hence it is that practitioners in general have lost their faith in the power of camphor as correcting the acrimony of cantharides; and, for preventing the strangury, trust entirely to a large exhibition of Arabic emulsion, and to the plaster's not being allowed to lie on after its blistering effects have been produced.

Another virtue ascribed to camphor, employed in combination with other remedies, is its moderating the action of mercury. If the saline preparations of the latter are triturated with a portion of camphor, this, Dr. Cullen says, abstracts a part of the acid that had been united with the mercury, and in

that way renders the preparation more mild than before, yet, at the same time, this does not deprive the preparation of much of its deobstruent virtue. This, he says, he had experience of in that very acrid preparation of mercury the *hydrargyrus vitriolatus*, and also in calomel, which, by being triturated with camphor, becomes less purgative, and less apt to excite a salivation. How far this mitigation of the preparations of mercury leaves them equally powerful as before in the cure of syphilis, he will not, however, determine; but says, he is of opinion that it does *not*, if they be employed in the same quantities as they would have been without intermixture. But many practitioners go still farther, and allege that mercury, in every condition, united with camphor, becomes a more mild substance, and proves less irritating to the system, while it is no less powerful than before in curing the diseases to which it is adapted. On this subject Dr. Cullen asserts, that in many trials which he made, a quantity of camphor added to our common mercurial ointment neither prevented it, when employed in the usual quantity, from exciting salivation, nor rendered the symptoms more mild than usual.

A peculiar combination of camphor said to have considerable effects, is that with *opium*. The employment of this important remedy is, in many persons, attended with great inconvenience and disorder; and it has been alleged by some respectable persons, that camphor joined with it prevents these inconveniences. This, however, has not been the case in Dr. Cullen's experiments. He found large doses of camphor dispose the patient to sleep, but commonly with that same confusion of head and turbulent dreams which sometimes arise from the use of opium; but he did not find that a small quantity of camphor had any effect in increasing the power of opium, or that it rendered the operation of the latter different from what it would have been if employed alone. But against the respectable authorities of Lasonne and Halle, the Dr. modestly suspects, that his experiments should not be considered as decisive.

Of the combination of camphor with the preparations of antimony, the highly eminent character from whom we quote has not taken any notice. It is a fact, however, that very considerable doses of tartarised antimony may be given in fevers, if combined, by triture, with camphor. But how far these remedies are friendly or inimical to each other in their operation, when thus exhibited, remains for future discovery: the fact, however, we venture to speak of confidently.

The only instance of the improvement of a medicine from its combination with camphor, is that mentioned by Mr. Lasonne, who assures us, that camphor joined with the cinchona, gives it more energy and force, whether it be employed in fevers or in gangrene; and this Dr. Cullen says he believes to be well founded, though he relates nothing directly in proof of it.

After having treated of the peculiar properties of camphor, we must next speak of its exhibition. It is evident that it may be given in very different quantities; and Dr. Cullen says, it appears to him, from many trials, that doses of a few grains, repeated only after long intervals, have hardly any effect at all. "To obtain sensible effects from it," says he "it must either be given in large doses, not under that of twenty grains, or, if given in smaller doses, these must be repeated frequently after short intervals. The latter practice is preferred by some eminent practitioners. To what length in either way we may proceed, I have not experience enough to determine with any precision. From the effects of two scruples given in one dose in the case narrated above, and in another quoted from Hoffman, it would appear that such doses are violent and dangerous; but from some other experiments, it appears that even larger doses have been sometimes given with impunity: and when it is given in divided doses, it appears from Collin's experiments, that it may be given to the quantity of a dram, or two drams in the course of a day; and in one of his experiments it was given to the quantity of *half an ounce*: and the same will appear from the history given above. It is probable that from large doses only, considerable effects are to be expected; and as, from many experiments, it appears that the effects of camphor are not very durable in the body, it will be obvious that the repeated and long continued use of it may be necessary to the cure of several diseases."

When camphor is to be exhibited, it is, in the first place, necessary that it should be very minutely divided; for, as it is not readily dissolved in the stomach, it will, while remaining there, float on the surface of the other contents, and in that way be applied to the upper orifice of the stomach, so as to occasion great uneasiness there. This may be done by rubbing it, as is generally practiced, first, with a few drops of spirits of wine, and afterwards with any dry powder, such as nitre or loaf sugar. Or camphor may also be divided by rubbing it with the mucilage of gum arabic; but this will also be more perfectly done if it be previously dissolved either by a little spirit of wine or expressed oil of any kind. On being diffused in the mucilage of gum arabic, it may be again diffused in any watery fluid for more convenient exhibition; but it is to be observed, that camphor diffused in a watery fluid is disposed to separate from it, and rise to the surface, so as to render the exhibition more disagreeable. This is most effectually prevented by triturating the camphor with mucilage alone, or with a portion of sweet almonds, and diffusing it again, by means of mucilage, into an emulsion.

It is thought by some, that the virtues of camphor may be increased by exhibiting nitre along with it; but Dr. Cullen, in many trials, found no sensible benefit derived from this combination, which, he says, in any quantity that can be conveniently employed, has little effect on the system. It is with more probability alleged, that vinegar exhibited with camphor is of service; since it has been discovered, by Mr. Henry of Manchester, that the former will hold it in solution. Vinegar certainly affords the best means of correcting the taste of camphor, and seems even to render it less disagreeable to the stomach: and Dr. Cullen allows, that both by its refrigerant and antiseptic powers, it may contribute somewhat to the virtues of the camphor in that view.

The officinal preparations into which this remedy enters, are the following:—Ol. camph. *Edin.* Mistura, *Lond.* Emulsio, *Edin. Lond.* Tinctura, *Edin.* Spiritus, *Lond. Dubl.* Acid. acet. camph. *Edin.* Tinct. opii camph. *Lond. Dubl.* Linim. camph. comp. *Lond. Dubl.* Cerat. Lithar. acet. comp. *Lond. Dubl.*

CAMPHORA'TA, an epithet given to the *Camphorosma Monspeliensis; foliis hirsutis linearibus*, Linn. This plant took its name from its smell resembling so strongly that of camphor. It has been exhibited internally, in form of decoction, in dropsical and asthmatic complaints, but is totally rejected in the present day.

CAMPHORATES, salts formed by the combination of camphoric acid with alkaline, earthy, and metallic bases. There are twenty-four species enumerated in M. Fourcroy's Elements of Natural History and Chemistry. These salts were not known by former chemists.

CAMPHORIC ACID. If nitric acid be distilled several times (six or eight) from camphor, a crystallized salt is obtained, called the acid of camphor, which reddens syrup of violets and the tincture of turnsole. Its taste is bitter, and it differs from oxalic acid, in not precipitating lime from the muriatic acid. The union of this acid with different bases, forms what the modern chemists call *camphorates*, none of which have yet been used medicinally.

CAMPHORO'SMA, a genus in Linnæus's botany. He enumerates five species.

CAMPHORO'SMA MONSPELIENSIS; the systematic name of the plant called *camphorata* in the pharmacopœias. See Camphorata.

CA'MPULUM, (καμπυλον from καμπτω, *to twist about*); a distortion of the eye-lids.

CANADA BALSAM. See Balsamum canadense.

CANA'LES SEMICIRCULA'RES, the semicircular canals. They are three in number. They begin in the vestibulum of the ear, wind round the bone, and terminate in the vestibulum again. Each at their origin has a separate orifice, but, the two perpendicular meet and return into the vestibulum by one common orifice. See Ear.

CANALI'CULUS ARTERIO'SUS, a blood-vessel between the pulmonary artery, and the aorta in the fœtus, which is obliterated in the adult. It conveys the blood, which in a fœtus has no passage through the lungs, from the pulmonary artery into the aorta.

CANA'LIS NASA'LIS; a canal going from the internal canthus of the eye downwards into the nose. It is situated in the superior maxillary bone, and is lined with the pituitary membrane continued from the nose.

CANA'LIS PETITIA'NUS; a triangular cavity, naturally containing a moisture, between the two laminæ of the hyaloid membrane of the eye, in the anterior part, formed by the separation of the anterior lamina from the posterior. It is named after its discoverer, M. Petit.

CANA'LIS VENO'SUS. The vein of the *funis umbilicalis* proceeds from the placenta to the navel of the child, and thence to the vena portæ, with which it communicates by its main trunk, where there is a canal, which goes to the vena cava hepatica, that is called thus, and also, by some writers, *ductus venosus*. It runs between the lobulus Spigelii, and the left or small lobe of the liver. This *ductus venosus* enters the *vena cava hepatica* of the left side, just where that is piercing the great trunk of the *vena cava inferior*.

CANA'NGÆ OLEUM, an essential oil distilled from the flowers of the lime-tree. Hoffman mentions it as being scarce, and brought from India.

CANARI'NA, a genus in Linnæus's botany. There is but one species.

CANA'RIUM, a genus in Linnæus's botany. He describes but one species.

CANARY BALM. See Melissa turcica.

CA'NCAMUM, (καγκαμον), a gummy substance brought from Arabia; but it is not known from what kind of tree it is produced, nor indeed is the thing itself well known. The *gum animé* has been generally sold for it by the druggists.

CA'NCAMUM GRÆCO'RUM. See Courbaril.

CA'NCER, (from καρκινος, *a crab*). By the term cancer, the Roman writers understood what the Greeks called gangrene and sphacelus; but the disease which is now called cancer is what the Greeks and Romans meant by *carcinoma*, and *carcinos*. It was called also *lupus*, because it eats away the flesh like a wolf. When a malignant scirrhus, or warty excrescence, has proceeded to a period of ulceration, attended with a constant sense of ardent pain; is irregular in its figure, and presents an unequal surface; if it discharge sordid, sanious, or fœtid matter; the edges of the sore being thick, indurated, and often exquisitely painful,

sometimes inverted, at other times retorted, and exhibiting a serrated appearance; and should the ulcer in its progress be frequently attended with hæmorrhages, in consequence of the erosion of blood-vessels; there will be little hazard of a mistake in calling it a cancer, or cancerous ulcer.

Dr. Cullen places this genus of disease in the CLASS *Locales*, and ORDER *Tumores.* He defines it a painful scirrhous tumor, terminating in a fatal ulcer. Any part of the body may be the seat of this disorder, though a gland is generally its immediate situation. The obstruction is supposed to be in the minute lymphatic vessels, and the adjacent parts are affected as a consequence.

It is probable that any gland in the living body may be the seat of a cancerous disease; but it appears more frequently as an idiopathic affection in those glands that form the several secretions, than in the absorbent glands; and of the secreting organs, those that separate the fluids, which are to be employed in the animal economy, suffer much oftener than the glands which secern the excrementitious part of the blood. Indeed it may be doubted whether an absorbent gland ever be the primary seat of a true scirrhus. Daily experience evinces, that these glands may suffer contamination from their connection with a cancerous part; but under such circumstances, this morbid alteration being the effect of a disease in that neighbourhood, it ought to be regarded as a secondary, and consequent affection. Mr. Pearson asserts, that he never met with an unequivocal proof of a primary scirrhus in an *absorbent gland;* yet if a larger experience should confirm this observation, and establish it as a general rule, it will afford a material assistance in forming the diagnosis of this disease. He says, "the general term *scirrhus* has been applied, with too little discrimination, to indurated tumors of the lymphatic glands. When these appendages of the absorbent system enlarge in the early part of life, the disease is commonly treated as strumous; but as a similar alteration of these parts may, and often does, occur at a more advanced period, there ought to be some very good reason for ascribing malignity to one rather than the other. In old people, the tumor is indeed often larger, more indurated, and less tractable than in children; but when the alteration originated in the lymphatic glands, it will very rarely be found to possess any thing cancerous in its nature."

Celibacy, as well as the cessation of the menses, conduces to the production of cancers in women, whence antiquated maids are the most subject to them: next to these are those mothers who have not suckled their children; then those women who are past child-bearing; and the least so are men, and those women who have borne children, and nursed them with their own milk.

When this disease takes place in glandular parts, and particularly in the breasts of women, a number of hard chords are found to extend themselves in different directions from the principal tumor. To this circumstance, which presents to the imagination the idea of a resemblance to a *crab*, is owing the name by which the earliest writers have distinguished a complaint, for which, indeed, nothing more appropriate can be devised so long as we remain, as at present, so entirely in the dark respecting its true nature.

As these hard chords, which are nothing more than inflamed and hardened absorbent vessels diverging from the principal tumor, were observed by the ancients to occur in other ulcerations than those to which, in our days, the term cancerous is confined, it became common with them to consider as cancers, various complaints, which, in the more improved state of surgery among the moderns, were afterwards placed in a very different class.

When a hard tumor, which has existed a long time in the breast, without either diminishing or increasing, and without giving any pain, begins at length to grow uneasy, to extend gradually in its dimensions, and to be affected with occasional pungent and *lancinating* pains, there is reason to suspect that it is taking on the cancerous action. This is not, however, invariably the case; since many instances have occurred, where the tumor has fallen into a state of inflammation, and even been attended with that peculiar kind of pain which most of all is to be suspected, and yet the disease has not proved to be of that fatal nature, but the patient has received a certain, though tedious cure. These instances, when they do occur, are eagerly laid hold of by quacks and the venders of nostrums; and are advertised as instances of the efficacy of their plans, which unwary persons, really affected with cancer, are sometimes drawn in to make trial of, at the expence, perhaps, of the only resource which remains for their security.

The lips, the tongue, the face, the penis, and testicles, are the most common situations of cancer in men: in women, it is usually confined to the breasts, the uterus, and the rectum; though, in either sex, any of the soft parts may be attacked by it.

The disease does not put on the same appearance in every instance, but, in common with some other local affections, is so far influenced by the peculiarity of structure of the part affected, as to exhibit very distinct appearances. These, indeed, have borne so little resemblance in some instances, as to have tempted practitioners to deny that the general term cancer could be strictly applied to them. Mr. Adams thinks the cancer of the uterus, at least, a very fair exception; and not only that of the rectum, but every carcinomatous affection

which begins on the skin, or parts superficially situated, seems clearly distinct from the same disease in the breasts or other secreting glands.

A preceding or preparatory stage of this disease authors have distinguished by the name of *scirrhus.* The scirrhous state of a gland is that in which the tumor gives no uneasiness, and in which the skin does not lose its natural colour. Every indurated and insensible tumor in a gland is, therefore, strictly speaking, a scirrhus: the term, however, is never applied to such affections, unless they threaten to terminate in cancer. See Scirrhus.

When a scirrhous tumor has advanced to a cancerous state, the hardened substance takes on some degree of irregularity; and not only becomes more or less attached to the part on which it grows, but advances, in a certain degree, towards the skin, which participates in the disease, and forms a kind of tucking in, or fissure. At this part the alteration commonly begins, which gives the disease the name of an *open* (in opposition to the term *occult)* cancer; and from this breaking kind of state, it gradually proceeds to such a process of ulceration, and consequent discharge of matter, as calls for the daily renewal of some kind of external dressing. Some would call this an ulcerated cancer rather than a cancerous ulcer; but we know of no ulcer but that which, in other words, might be called an open cancer, to which the epithet *cancerous* can be strictly applied.

Indeed, it is not uncommon with practitioners who have had few opportunities of marking the progressive steps by which the cancerous ulcer is established, to consider as such, other ulcers (particularly of glandular parts), which have a strong degree of malignity in themselves, and also resemble cancer in their spontaneous beginning, their slow progress, and the kind of pain they have been attended with. Hence we see the importance, not only of obtaining from the patient an accurate and circumstantial history of the complaint, but also of being able to distinguish which of the symptoms are, and which are not, fairly referable to causes of a cancerous nature.

It is not in every case, however, that the progress of a cancerous affection is slow; for although, in the generality of instances, a period of some years elapses before it passes through its preparatory stages, in some habits, the disease becomes complete even in the course of a few months. In such cases, there are successive and violent attacks of local inflammation, and the constitution also suffers by a corresponding degree of fever; each apparently acting in succession as cause and effect: for it is by no means uncommon to find the fever preceding the renewal of the local inflammation. That the system is very materially concerned in cancerous affections, is evident, from the loose texture of the blood, which has been found to prevail in persons predisposed to it. On this principle, perhaps, we may account for the disposition to hemorrhage so prevalent in the open state of cancerous ulcers, and likewise for the extraordinary acrimony, corrosiveness, and peculiar fetor of the discharge.

Concerning the causes of cancer there have been a great many conjectures, but without any solid foundation. It is of some moment, however, to determine whether they arise from any general disorder in the system, or whether they are only to be accounted local diseases. Many of the most eminent practitioners have been of opinion, that they arise from a general disorder of the system, and hence consider them as totally incurable even by extirpation; as the latent seeds of the disease, in their opinion, will not fail to bring on a return of it somewhere or other. Of this opinion the late Dr. Monro appears to have been; and in a paper on this subject, in the Edinburgh Medical Essays, declares that " of near sixty cancers which he had been present at the extirpation of, only four patients remained free of the disease at the end of two years." From this bad success, and the violent progress of the disease, he finally concludes against the extirpation of cancers, and proposes only the palliative method of cure. But later practitioners have been a great deal more successful; and their experience has put the usefulness of extirpation beyond a doubt, when the operation is performed in time; though, after the disease has continued long, and the virus been absorbed, the whole system acquires a cancerous disposition, and the disease almost certainly recurs in some other part.

The late Dr. Adair Crawford, in the Philosophical Transactions, vol. lxxx. page 391, has given an account of some experiments, made with a view to detect, by *chemical agency*, the nature of cancerous virus; and we shall here concisely mention their result. It is alleged,

1. " That the appearance of a powerful *volatile alkali* is detected in the discharge.

2. " That with this alkali, there is united an *aërial fluid*, possessing the chief properties of *hepatic air*.

3. " That by the combination of these principles, a sort of *hepatised ammonia* is formed, on which the *deleterious nature* of the matter depends." A " peculiar offensive fetor" in the discharge; " the swelling of the contiguous lymphatic glands; and lastly, " the corrosion of vessels;" are indications of the existence of the real cancerous poison; and so great are its powers of corroding, that they act not only on the animal fibre, but even on metals. The celebrated Van Swieten alleges, that he has seen the texture of linen rags as completely destroyed by it as if they had been moistened with nitrous acid; it is not very

usual, however, to witness these effects in common cases.

The experiments of Dr. Crawford on this interesting subject, naturally led him to some conjectures as to the remedy most likely to counteract the cancerous virus. Of this we shall take notice hereafter, and shall now proceed to the treatment, which we shall consider under the two general heads of *radical* and *palliative*.

I. The RADICAL CURE.—In its early stages, the disease in general may be considered as entirely a local affection, and a radical cure may be of course expected; but in proportion as the skin shall afterwards be found diseased and adhering to the gland, and that to the pectoral muscle, and the lymphatic glands near the mamma and in the arm-pit swelled, the chance of a cure becomes more hopeless, as the cancerous matter may have been absorbed, and carried into the system.

The radical cure has been attempted in two ways; by mechanical extirpation, and extirpation by caustic: of these we shall speak in their order, and conclude with noticing briefly the attempts that have been made with a view to a radical cure by different internal remedies.

1. The most unfavourable state for the operation in the case of cancerous mamma, is when there are ulcerations, large, deep, and of long standing; and particularly if these are attended with great pain, when the arm of the side affected has become œdematous, and the health of the patient is much impaired. In this last state, very little is to be expected from a surgical operation. It is only therefore in the early state first described, that this mode of cure should ever be adopted, though, as we shall see, it is almost the only one that can be relied on. Mr. Bell, in his Treatise on Ulcers, observes, that the sooner an operation takes place, the greater is the chance of the extirpation proving effectual, and vice versa. This, however, is contradicted positively by Mr. Pearson, who says, "If the removal of the morbid part were equally complete in two patients, one of whom had been afflicted seven months, and the other seven years, with a cancer, I should esteem the latter in less danger of a relapse than the former. For example, when the breast is affected by a cancer, distant parts of that gland may become the seat of the morbid alteration about the same period. These several diseased portions may not advance with equal celerity; but while one part acquires a considerable bulk, the other altered parts may be scarcely objects of attention. Under such circumstances, the more obviously morbid parts may be removed; but the disease being only in progression, no man can be certain, without removing the whole breast, that he has not left some diseased fibres. If, however, the disease shall continue without increasing, during several years, one may in general conclude, that its boundaries are more accurately defined." Conscious that such accidents may occur, Mr. Bell therefore advises, when the complaint is on the breast, although part of it only may be affected, that the whole should be always taken off. But, although it be proper to extirpate every part that is really diseased, none of the external teguments should be ever unnecessarily destroyed, nor should more of them be taken away than is requisite. He says, a little before the sore heals up, an issue should be introduced, so as to discharge freely before the cicatrix is formed. If scirrhous or cancerous disorders appear in several different parts, the removal of any or all of them would not probably be effectual. If cancers adhere to any important part, they rarely can be extirpated with safety: a cancerous tumor may be attached to a circumjacent muscle or tendon, and may admit of an operation; however, much prudence is requisite in attempting such a case.

In *extirpating the mamma*, which we shall first suppose is to be done where the skin is sound, and where the tumor has no uncommon adhesion to the pectoral muscle, the patient ought to be placed horizontally in a bed, or upon a table covered with a mattrass, &c. The operator is to be seated, and to have proper assistants. A longitudinal incision is then to be made, with a common scalpel, through the skin and cellular substance, along the whole extent of the tumor, and at a little distance from the nipple, which is to be saved. When the longest diameter of the tumor is across the body, instead of a longitudinal incision, a transverse one is to be made. The integuments being dissected from the mamma on both sides of the incision, the patient's arm is to be extended, to save the pectoral muscle; and the whole glandular part is to be detached from the muscle, though a small portion only should be diseased, beginning at the upper side, and separating downwards. If there be any indurated glands, they are to be carefully removed. If the patient be faint, a glass of wine, or some other cordial, is to be given. After the diseased parts are removed, the wound is to be cleaned with a sponge wrung out of warm water; which will generally render the small bleeding vessels more conspicuous. The integuments are next to be closely applied to the parts underneath, and retained there by the twisted suture, and likewise by a few adhesive straps. A large pledget of simple ointment is now to be laid over the whole; and this is to be covered with a thick compress of lint, tow, or soft linen; and the dressings to be kept in their place, and moderate pressure made, by the napkin and scapulary bandage.

By this method, the integuments will generally soon adhere, and a union will be effected by the

first intention. But it does not often happen, that the operation is performed while this favourable mode of practising it will answer; on the contrary, it has often happened, that, although the skin bore no marks of a cancerous affection, the disease has been renewed and terminated fatally.

In general, before extirpation of a breast is recommended by the surgeon, or submitted to by the patient, a considerable part of the external integuments are so much diseased as to render it necessary to separate them along with the glandular part of the mamma. It sometimes happens, likewise, that the tumor adheres to the pectoral muscle, and that again to the ribs. In either of these cases, it becomes necessary to remove all the diseased parts. For this purpose, two incisions of an oval form, with sharp extremities, of a sufficient size to include the whole of the affected parts, become necessary. If, again, it be found, that, besides the disease of the breast, the lymphatic glands in the neighbourhood are indurated, or otherwise diseased, the first incision ought to extend at once over these; and after the other parts have been removed, and the vessels secured, the whole of the diseased glands are to be extirpated; and, in performing this part of the operation, considerable assistance may be given by supporting them with a hook, or a ligature passed through them, till they are entirely removed. When they lie deep in the axilla, the points of the fingers, or the end of the handle, will sometimes be safer than the edge of the knife. After having removed all the glands which are in the smallest degree affected, the cut edges of the skin are to be brought as near to each other as the nature of the case will allow, so as to heal as much as possible by the first intention. After the wound is nearly, or perhaps entirely, healed, an issue, inserted into the arm of the opposite side, has been recommended as the best means of preventing a relapse.

2. By some surgeons, the radical cure has been attempted, and in *some* instances successfully, we believe, by *caustics*. By these it has been proposed to destroy the tumor, when the knife cannot be submitted to from the existence of circumstances unfavourable to the attempt, or, as more frequently is the case, from the patient's dread of it. Most of the caustics employed with this view have arsenic in their composition. Mr. Plunket's once famous receipt is, on good authority, the following:

"Take of crow's-foot, such as grows in low moist grounds, dog-fennel, of each half an ounce; pound them well: add to them of crude brimstone, five scruples; and of white arsenic, (some prefer the *magnes arsenicalis*,) finely levigated, one drachm. Make these into small balls, and dry them in the sun. These balls must be powdered and mixed with the yolk of an egg, then laid over the sore or cancer upon a piece of pig's bladder, which must be cut to the size of the sore, and smeared with the yolk of an egg. This must not be applied on a piece of bladder larger than a half-crown, if the cancer to be extirpated is on the face; the same caution is required if it is near the heart; but elsewhere it may be spread the size of the sore. The plaster must not be stirred until it drops off of itself, which will be in about a week. Clean bandages are often to be put on." This, which the inventor called *causticum anti-cancrosum*, requires, in its application, great circumspection, particularly on the nose or lips, on account of the danger of swallowing a portion of the arsenic.

We are told, that this arsenical remedy will answer best in recent cases, but it should never be used except the whole tumor can be removed. Mr. Pott, indeed, observes, that, if a caustic is used, it should be such a one as will penetrate *quite through the tumor*, and effectually eradicate it at the most in two or three applications. This, however, the common caustics will not do, for they only reach as far as into the cellular membrane; from which circumstance their frequent repetition becomes necessary. Hence a serious objection arises; for, on every repetition of the caustic, the tumor re-inflames, hardens, and enlarges, and consequently becomes, by such treatment, more and more untractable. Trivial caustics, there is no doubt, harden the surrounding parts, and produce other ill effects, besides unavailing pain, to the patient. There are, however, other caustics, besides arsenic, of irresistible activity; for instance, the *hydrargyrus muriatus*, which is recommended by Dr. Moseley in the extirpation of a peculiar cancer called the *Bay-sore*. See SORE. Indeed, the danger of arsenic externally, so as to hazard its absorption, is a circumstance not to be overlooked. From a continued application of this remedy, paralytic affections have been brought on; though these consequences are perhaps less to be expected from its use as a *caustic*, than in any other form.

In a cancerous tumor, in which other methods were tried without success, an attempt was made to extirpate it by arsenical caustic. The patient was extremely timorous, and would by no means be persuaded to submit to the operation by the knife. She had a very stubborn scirrhus in the right breast, just above the nipple, of the size of a small apple, and beyond this a small indurated gland under the axilla. The arsenical preparation used in this case, was the following; called, in the last edition of the *Pharmacopœia Chirurgica*,

Arsenicum Antimoniatum.

℞ Antimonii in pulv. trit. unc. ij.
Arsenici alb. unc. j. Misce.

These are to be fused, in a crucible, together, and afterwards reduced into an impalpable powder.

A few grains of it were mixed with as much powdered opium ; but as the skin was entire, and as the arsenic would not act through the cuticle, the day before this powder was applied, it became necessary to rub the whole surface of the gland gently with lunar caustic. By this contrivance, the cuticle was easily separated next day, when a small quantity of the powder being mixed with part of the yolk of an egg, so as to bring it to the consistence of an ointment, a pledget was spread, cut to the size of the gland, and applied to its whole surface. The pain was very great for the first four-and-twenty hours, but after that subsided. This first dressing remained on for several days, and, when removed, it appeared that that part of the skin on which the caustic had been applied was cracking all round, and the tumor beginning to separate. In expectation of facilitating this separation, a few scarifications were made on the destroyed surface, and the crevices filled with more of the powder, applying over it a pledget of the same kind as the former. By repeating this, a separation of the tumor was effected in little more than two months, and the gland came out entire as a nut out of its shell, or as if it had been cleanly dissected with a knife. To the small gland under the arm-pit nothing was done, in the hope that it would dissolve spontaneously by the suppuration of the larger one, but it still remained ; though this circumstance did not prevent the wound, made by the separation of the larger gland, from healing very fast. Seeing the small gland still exist after the healing of the wound, persuasions were used with the patient to allow the caustic to be applied to that in the same manner as it had been to the large one. But she was so well satisfied with having got rid of the most material part of the disease, and being freed from the pain which that gave her, and so fearful of going through the same violent pain again, that she chose rather to remain with it as it was. She was seen about a year and a half after this in perfect health : the little gland under the arm-pit remained indeed, but it was neither increased nor decreased in size. She suffered no pain from it, and there was then no appearance of further mischief.

3. The danger of treating cancers with arsenic externally having been manifestly shown, the exhibiting it, at least for any length of time, *internally*, with the view to a *radical cure through the medium of the constitution*, cannot be supposed a very desirable practice. We shall be brief, therefore, in the mention of this and some other remedies, vainly supposed to have a specific effect in this miserable disease.

Arsenic.—There has been published by Dr. Rush, in the American Transactions, and since inserted in the Medical Commentaries by Dr. Duncan, vol. i. decad. 2d. *a paper on arsenic in cancerous affections.* The same remedy has been recommended by Dr. Le Febure, a French physician, an extract from whose memoir is given in vol. iv. of the same work. Other advocates have also appeared very lately, particularly Mr. Simmons, of Manchester, whose papers on the subject are inserted in the Medical and Physical Journal.

The late Mr. Justamond, of London, after observing, that in the full exhibition of hemlock in every form, as well as in other means employed, his hopes were cruelly frustrated in many instances, " yet," says he, " I could not but be convinced from the result of all my cases, that something more had been effected by these methods, than had been done by others ; and as arsenic seemed to be the best application externally, I resolved, in the first obstinate case, to try it internally. I was the more induced to this, from knowing that it had been administered by others, and from an account recently published, in which it was said that this medicine had been given with effect in cancerous complaints. I determined, however, to give it in my own way, and, therefore, weighed out a grain of arsenic, and mixing it thoroughly in a glass mortar with a scruple of testaceous powder, made it up into a mass of pills, with a small quantity of syrup. This was divided into sixteen pills, made exactly equal, by carefully weighing them separate against each other." The author relates several cases, which, however flattering to his hopes in some of their circumstances, led at last to the following conclusion. Describing the effects of this remedy in the case of a female patient in the Westminster Hospital, he says :—" This and the succeeding case of *a cancer in the face*, were the only two instances in which a *fair trial* was given to the *internal* use of arsenic. Encouraged by the fair prospects these trials afforded me at first, I had begun to give it to two other patients. But as the hopes I had entertained of its efficacy in the two first instances, were afterwards disappointed, and as, however promising the internal use of the arsenic might appear to me in these complaints, it still seemed impracticable to give it in such doses as to insure success, I thought myself not justified in continuing or repeating the trial I, therefore, would not suffer my other patients, who had begun, to continue taking it : and from that time never prescribed any arsenic internally, judging that the advantages arising from it were not sufficient to compensate the risque. The ascertaining of this point appears to me to be a very essential, and, indeed, a very necessary circumstance ; for if, from the boldness of some publications on the subject, others should be tempted, as I was, to make the experiment, in hopes of contributing to the relief of mankind in these terrible cases, they will probably be deterred from it by this fair exposition of the matter. At

the same time, I am inclined still to think, from all the observations I have been able to make, that arsenic is really the true antidote against this disease; but as its internal use is attended with great danger, and that every attempt to correct its noxious qualities seems to lessen its efficacy, it is not probable that it can ever be given so as to produce a complete cure."

Cicuta.—Of the narcotic tribe of vegetables hemlock (*Conium maculatum*, Linn.) stands at the head of the list. It was first regularly introduced into medicine, for internal use, on the authority of Baron Storck, after having ascertained the safety of its exhibition in his own person. Like most new medicines, it has been both over-rated and undervalued in an improper degree. That cures of this disease have been made by hemlock, is a fact vouched by some respectable though probably mistaken authorities; since it is universally known to have failed in cases without number.

If it ever have succeeded in a case of true cancer it may be presumed that it is only in the first stage of the disease, that either hemlock, or indeed any other article of the narcotic tribe, can have been effectual. For if the destruction of organization, or actual scirrhus, has commenced, it is clear, that no resolution can take place; the tumor can only be lessened by the process of suppuration, which requires the bursting of the teguments. However, no accurate judgment can be formed when the *first stage* of the disease is *terminated*, and the *actual scirrhus* begun. In many cases, the solids being lax, the state of simple obstruction will remain, even though the swelling be pretty considerable in size; while in others, where the solids are more tense, a destruction of organization will take place, even though the tumor is small, and we might suppose, from appearance, simple obstruction alone prevailed. This remedy appears to have been more successful with Storck in the stage of tumefaction than of ulceration, which Dr. Nisbet accounts for in this way. At the same time he doubts, whether, in his cases, that writer adhered always strictly even to scirrhus; for many of them appear to have been swellings of a scrofulous character, or at least of a doubtful one with regard to their cancerous nature. Indeed there is some room for the scepticism of subsequent authors on this subject. The late Mr. Hill, surgeon at Dumfries, has gone even the length of affirming, that "were it his misfortune to have a cancer, even of the slightest kind, he would not delay [extirpation] a single hour in expectation of obtaining a cure from the use of hemlock."

In its general use, this remedy has been exhibited in almost every form, of powder, bath, extract, &c. but the last is most common. When used, the plant should not be gathered too young, but when its flowers begin to decline, for, at that time, its powers are the strongest; and as it is sensibly weakened by the action of fire, its *recent powder* is, perhaps, its best form. See Cicuta. We may begin with six grains of this in the day, and gradually increase it to the extent of seventy, or even more; but as it is a medicine very apt to vary in its strength, from the different circumstances of its age, growth, &c. the rule observed by practitioners is to begin with a small dose, and carry it to such a length, as to produce sensible effects on the head and stomach; and in this way it has been brought to 120 grains (of the powder) in a day; nay, a case is mentioned in the xxxviiith volume of the Journal de Medicine, of 360 grains of the *extract* being daily used; and there is an account, by the late Mr. Hunter, of a patient who took to the extent of *two ounces and a half of the extract* daily, and was at last killed by recommencing a course of this medicine with only half the dose (ten drachms) with which he had left off. The symptoms that mark the action of hemlock, and indeed of all other narcotics, in an over-dose, are a *giddiness*, affecting the *head*, and *motions of the eyes*, as if something pushed them out of their sockets; a *slight sickness*, *trembling*, and general *agitation* of the body. When these occur in any degree whatever, it should be pushed no farther: some practitioners even think it proper at times to interrupt its use. Another form, in which the cicuta has been for some years past applied, is that of a *bath*. This practice was first introduced (with success according to report), into Germany; and this recommendation, though it had little influence with other practitioners in this country, as being highly inconvenient in its application, induced the late Mr. Justamond to adopt its use in the treatment of cancers, particularly of the uterus. See Uterus. This gentleman was, indeed, the first who made this practice known in Britain. The general effects of this remedy were not great, when employed, though attended with a free discharge of matter from the sores, with no remarkable tendency to granulation. One remarkable case, however, of its success in this form, occurred in the practice of Dr. R. Hamilton. Here its good effects were so speedy, and so conclusive, as to render it entitled to a farther application. In this case, it was observed, that no granulation of the ulcer took place, but the sides contracted every day, till they became contiguous, after which they united from the bottom upwards.

Having been somewhat particular in speaking of *hemlock*, we need not repeat the same observations on the properties of the whole of the *narcotic tribe*, which are very similar. We shall, therefore, confine ourselves to the circumstances alone in which they are said to differ from each other, with reference to their medical use.

Belladonna.—Next in rank to the *hemlock*, for its supposed powers over this disease, stands the

belladonna, or *deadly night-shade*. See Belladonna. That cures have been made with it, under the same circumstances of the disease as by the use of hemlock, there are some who have boldly asserted, but that it has much more frequently failed, there is no doubt. It was first introduced into practice, as a remedy in cancers, by Dr. Alberti, in his dissertation at Halle. It was afterwards farther recommended by Professor Lambergen, of Groningen, who, like Storck with the hemlock, first tried the safety of its exhibition on his own person; and also by Dr. Munck. On the authority of these authors, it has been frequently employed since by a number of practitioners, with various success. At the same time it must be observed, that the utter silence now observed with respect to its virtues, is the best proof that it has not deserved the encomiums its first recommenders bestowed upon it. One of the most convincing instances, however, of its good effects, is related by Dr. Cullen, according to whose account, though it did not complete a cure, still it showed strong powers over the disease; for being used for a time, and then laid aside for an equal length of time, the progress of the malady corresponded entirely to these periods of its use and suspension, exactly as in Mr. Hunter's case of the gentleman destroyed by an overdose of hemlock. When the use of belladonna is at all beneficial, it is generally attended with evacuations, particularly by sweat or urine. It is the extract of the leaves of the plant that is generally preferred; but it is also employed in other forms. The *infusion* of it has been known to bring on a disagreeable dryness, or stricture of the throat, which, in some cases, has prevented its being pushed to a proper extent. It is begun with about a grain for a dose, and gradually increased. The *powder* of the *dried leaves* is preferred by some to the infusion of the recent plant, but the former seems less likely to possess the active qualities required.

Aconitum.—The plant named *wolf's-bane* is another remedy of this class, which, from the experiments of Dr. Storck, is said to have been successful in the cure of this malady, where the cicuta failed. See Aconitum. Its effects few persons in this country have had experience of. In its nature it is the same as the remedy last mentioned, and acts probably on the same general principle. That it is highly deleterious, however, a number of fatal instances have unfortunately proved; and, therefore, great circumspection must be used in its exhibition. It is given, either in the form of extract, powder, or tincture. More commonly, two grains of the inspissated juice are rubbed with two drachms of *sugar*: and of this ten grains are given night and morning. The powder is to be administered, as in the case of the aconitum, in the most minute dose. To form a tincture, one part of the leaves is used to sixteen of proof spirit, and from thirty to forty drops are a dose.

Hyosciamus.—Among the same class of remedies is the *hyosciamus*, or *henbane*. (See Hyosciamus.) This powerful vegetable was also introduced into modern practice by Dr. Storck, who employed it against this malady; but it has been used by the ancient physicians as an anodyne from the earliest periods of medical history. When administered in cancerous cases, it is preferred in the form of extract from the leaves; the dose commencing with the quantity of a quarter to half a grain. From this it has been gradually extended to the length of a scruple or half a drachm, repeated according to its sensible effects.

The distilled water of the *lauro-cerasus* has been tried by Professor Richter of Gottingen, in various ways, in the extent, of from forty to sixty drops. No success over the disease, as far as we are informed by him, attended its use; and as it produced dysenteric, and other morbid symptoms, it seems to be a remedy not safe to be persisted in.

In treating cancers with the foregoing narcotics, Dr. Nisbet says he has *joined* the use of the *nux vomica*, an article possessing both strong *tonic*, as well as narcotic powers. But, he says, from all the trials he was able to make, "any advantage derived from its use was confined to the ulcerated state; and while it gave a more cleanly appearance to the sore, it evidently increased the scirrhus."

To these, which have been the principal articles of the narcotic tribe, employed in cancerous cases, many others might be added. It is said, that among the Turks, some other vegetables of this class are used very successfully. These, however, are unknown to the practitioners of this country; but whatever their powers may be, still the general principle of these remedies, as far as they may be supposed applicable to the disease under our consideration, is the same; and whatever other combination of quality they may unite with their narcotic virtues, the same may be supplied by joining our own narcotics with remedies of another description, if such an experiment should be thought advisable.

Carbonic acid.—Much has been said formerly, and repeated of late by Dr. Ewart, on *carbonic acid gas* (fixed air) in these complaints. As very great expectations have been raised by some writers, of this, as a remedy in open cancers, we shall take the present opportunity of communicating Mr. Justamond's observations respecting the use of it.

"I have tried it," says that gentleman, "in several cases of ulcerated cancer, for a considerable time; and pursued the following method in applying it. I first adapted an open bladder to the end of a flexible tube of a convenient length, and placing this bladder upon the sound parts round

the cancerous complaint, so as carefully to include the whole of the disease, I confined the margin of the bladder by applying to it a piece of adhesive plaster, which was likewise held close to the surrounding parts by one or more assistants. The end of the tube was then fixed into the mouth of a pretty large bottle, into which the usual fermenting materials had been put. This application was renewed twice or three times in the day, and if I could have prevailed upon my patients to do it oftener, I would; being of opinion, that if any success were to be expected from it, it must be owing to its being reiterated frequently. I imagined, indeed, that if it had been possible to keep the part constantly immersed in fixed air, without any communication with the external air, this would be the most likely method of insuring success. However this may be, in all the cases wherein I tried it, it did not by any means confirm those expectations that report had raised in me of its utility. It never in any one instance disposed the cancerous wound or any part of it to heal; and all the benefit I experienced from the use of it, was *keeping the wound sweet and clean*. This indeed is no inconsiderable advantage, where these effects cannot be brought about by other means that are less inconvenient. Neither can I ascertain whether it contributed in any remarkable degree to abate the pain of the disease, for all the cases I tried it in were very far advanced, and the patients having been used to obtain relief from opium, did not choose to relinquish a medicine, the good effects of which they had decidedly felt.

"There are, indeed," continues the author, "other means of correcting the smell of cancerous ulcers, and much more simple than the application of an apparatus for the generation of fixed air, and which, from all the observations experience has furnished me with on this point, seem to answer the purpose as effectually. The several topics I have used for this purpose are the flowers of zinc, the calamus aromaticus in powder, either alone or mixed with such a proportion of powdered salt ammoniac as my patients could bear; these are the dressings I have chiefly used in the intervals of such as were more active, and by means of which, I have generally preserved cancers from any very offensive smell; and even in the last stage of the distemper, have succeeded in diminishing greatly this nauseous symptom." Thus we see the carbonic acid gas reduced, as we fear it too justly deserves, to the rank of a mere palliative remedy. Those, however, who are still unconvinced on the subject, will find it extended in a pamphlet on cancers, published at Bath, by Dr. Ewart, a sanguine friend to this remedy.

Iron.—The late Mr. Justamond, surgeon to the Westminster hospital, found (or thought he found) great advantage in the internal use of the *ferrum ammoniacale*, accompanied with the topical application of a liquid, of foreign invention, but of which equal proportions of *tinctura ferri muriati*, and spirit of wine, form an adequate substitute. The former was exhibited in such quantities as to insure its full effect on the constitution, the latter was usually applied with a camel's-hair pencil, or, in a diluted state, on linen rags. The following is the original receipt taken from the German Ephemerides:

"Ri. Ramentor. ferri lotor. et supra ignem in vase aperto siccatorum et minutissimé contusorum; salis armoniaci in pulverem redacti āā unc. iv. Mixta dentur in retortam terream optimè in fundo et circumferentia lege artis munitam, imponatur hæc capellæ, admoveatur vas vitreum recipiens, quod bene lutetur: detur ignis in gradu digestionis, et dum retorta calcfieri incipit; augeatur successivè ad sublimationis, finitaque sublimatione ad calcinationis gradum. Hoc facto successivæ refrigerationi committatur retorta, et ex refrigerata fractaque accipiatur calcinatum in fundo hærens, caput mortuum teratur, et subigatur minutissimé in mortario lapideo, dein subactum imponatur in vas vitreum et affundantur spiritus vini rectificatissimi Empyreumaticum odorem non redolentis lbij. Agitentur sæpius primis octo horis: post viginti quatuor horas agitatis denuo instilletur tribus quatuorve interstitiis observatis, acerrimi, ut vulgo vocatur, olei vitrioli nigri unc. i—ad quamvis instillationem semper mixta agitando; deinde in quiete permittantur per viginti quatuor horas, his elapsis decantetur tinctura, residuo vero in fundo affundantur prioris spiritus vini lbij. Agitentur iterum pluries, dein extractio de novo relinquatur per viginti quatuor horas; his transactis instilletur iterum, ut prius, olei vitrioli supradicti unc. i. Effervescentia finito vero infundantur spiritus tartari simplicis unc. iv. Agitentur et finita agitatione aliquoties repetita relinquantur in vase per viginti quatuor horas; his elapsis secunda hæc solutio misceatur priori decantatæ, et optime simul agitentur: tunc parata est ad usum *panacea nostra anti-cancrosa.*"

This Mr. Justamond had abundant cause to consider a very elaborate and unphilosophical process, and it was evident to him, that a tincture of the same properties might be made with much less trouble in the way we have suggested above. Accordingly, he omitted the vitriolic acid and oil of tartar, as being chemical enemies, and, as such, totally unnecessary. His first motive, indeed, for employing it, was the muriated ammonia used in it; but he was afterwards convinced, that the iron had a very considerable, if not the principal, share in its virtues. Some chemists indeed will think, that its effects depended entirely upon this last substance, since there is little of the ammonia retained in the tincture; the chief use of that addition in the process being to procure the dissolution of a

greater proportion of the iron. However this may be, Mr. Justamond asserts, that this liquid, or one of a similar kind, is likely to prove a very serviceable topic in the treatment of cancers: "For," says he, "besides the evident advantages obtained from it in the first case (which he describes), I have found it very useful in *dissipating recent scirrhous tumors*, in resolving *cancerous indurations*, or checking their progress; and in alleviating the peculiar darting pain which attends them. It is also useful in softening the callous edges of ulcers, and in stopping the advances of putrefaction, in the cancerous ulcer," &c.

We have gone thus far in our account of iron as a remedy in cancers, not from any conviction of its real value in this view, but as one which (like cicuta, and indeed almost every other that has been proposed) has produced encouraging effects in particular cases. The same motives merely have induced us to continue the catalogue by noticing the

Barytes muriata.—This was first recommended by Dr. Adair Crawford. From its sensible qualities, this remedy seems to possess active powers; but, except in two cases related by Dr. Crawford himself, it has failed in the hands of every other practitioner. It was given by him in the quantity of from four to twenty drops, twice a day, being entirely regulated by the state of the stomach; though, when carried even to this length, it seems to have produced disagreeable symptoms. When successfnl, he states, that it increased the flow of urine, and occasioned an amendment of the appetite and general health. As the barytes is, by Dr. Crawford's own account, so often contaminated with other metallic salts, it is of importance, when trial is made of this remedy, to exhibit it in its pure state, a method of doing which has been suggested by the author himself.

II. Palliative treatment.—As the disease, when arrived at the ulcerous state, can only be successfully combated through the medium of the constitution; and as none of the many remedies proposed have, on trial, been found to merit our confidence, it would be a waste of time even to enumerate them any farther; we shall, therefore, dwell principally on the lenient treatment, from which we may hope to procure for the patient some temporary advantages at least.

Our object then will be, 1st, To alleviate the violence of the pain: 2dly, To amend the discharge, or, at least, correct its fetor: 3dly, To retard the extension of the ulcer: 4thly, To restrain occasional hæmorrhages, and prevent their debilitating the system.

1. The remedies capable of alleviating the violence *of the pain*, are both internal and local. Of the former, not only opium, but most of the inferior narcotics, have been variously administered with considerable temporary effect. It is expedient, indeed, at almost all events, to carry the use of these remedies as far as the immediate safety of the patient will admit; not forgetting that, in the alleviation of pain, is, perhaps, involved the prolongation of life; for debility, the gradual increase of which marks the progress of cancer to its fatal termination, is greatly increased by long continued, and violent pain.

It is to this property alone in the different narcotic vegetables, spoken of in the foregoing section, that many practitioners attribute their supposed virtue in cancerous diseases. Pain not only abstractedly, but relatively, impairs the body. Its stimulus is not merely attended with direct morbid consequences, but tends also indirectly to the patient's injury, by destroying the appetite, and producing the most afflicting state of mental dejection.

We have seen, that the narcotic vegetables, exclusive of opium, are *cicuta*, *aconitum*, *hyosciamus*, and *belladonna*. On the medicinal properties of hemlock, a great diversity of opinions have been maintained; and for this there is a mode of accounting, of which few, perhaps, are aware. According to some writers, but more particularly Dr. Withering, *there are several ways in which the views of a medical practitioner*, in prescribing hemlock, *may be frustrated*. The plant chosen for preparing the extract may not be the true *conium maculatum*, which is distinguished by red spots along the stalk. It may not be gathered when in perfection, namely, when beginning to flower. The inspissation of the juice may not have been performed in a water-bath, but, for the sake of dispatch, over a common fire. The leaves, of which the powder is made, may not have been cautiously dried, and preserved in a well-stopped bottle; or, if so, may still not have been guarded from the ill effects of exposure to the light. Or, lastly, the whole medicine may have suffered from the mere effects of long keeping. From any of these causes, it is evident, the powers of cicuta may have suffered; and it happens, no doubt very frequently, that the failure of it ought, in fact, to be attributed to one or other of them.

To the foregoing list, a late writer has added the distilled water of *lauro-cerasus*, and *nux vomica*, of which we have already made mention. He has, however, done little more than name these remedies. The former, it seems, was tried without success by Professor Richter, of Gottingen. Yet, whilst the effects of it on the human body remain unascertained, a farther trial may not be improper, not only in this, but other diseases, for which, at present, no means of cure are known.

One or other of these remedies, accurately prepared, may be administered as palliatives, from small beginnings to a dose sufficiently considerable to blunt the feelings of the patient, and render the

pain of a cancerous ulcer very trifling. In some, perhaps, a beneficial change may be produced in the ulcer itself; though we are not to be too sanguine in our expectation of this.

The external remedies to be had recourse to in these unfortunate cases, are much more various. They consist, chiefly, of two descriptions, to wit, the emollient, and the sedative; and their modes of application admit likewise of being considerably varied. Besides employing strong infusions of the narcotic vegetables already mentioned, either in the form of fomentation and poultice, or by pledgets of lint dipped into them, we may add to the list an infusion of tobacco, a plant possessing, perhaps, the most powerful sedative virtues of any that have been named. Emollient remedies that are simply such, are less worthy of our choice than those last mentioned, which answer both intentions.

Where the use of fomentations and poultices happens to be ineligible, great ease may be procured by sprinkling the ulcer copiously with a fine powder of the leaves of cicuta. Sometimes the farina of malt alone will have a good effect; and the use of remedies in this particular form has this great advantage, that they absorb the acrimonious discharge, and thereby prevent much pain, which, from that cause alone, would be felt by the patient.

On some occasions, it has been said, a solution of asafœtida has been found not only to give ease, but to benefit the ulcer. The same may be said of cold-drawn linseed oil, alone, or with a small portion of camphor dissolved in it. Other practitioners have recourse to thick solutions of the narcotic extracts; joining with them a due proportion of borate of soda. Where any of these are tried, the mode of application is by pledgets of lint dipped into the mixture, and renewed according to circumstances.

But a remedy capable of affording much relief, not only in this, but almost in every view, is the application of a blister at some little distance from the ulcer. Where the pain occurs in a violent degree, it is generally brought on by some fresh attack of inflammation, and the blister, by exciting a powerful stimulus in its neighbourhood, will frequently have the effect, common to the same remedy in other cases, of drawing off inflammation, and consequently lessening the pain in the ulcer.

2. Of remedies which are calculated *to amend the discharge, and correct its fetor*, the number, correctly speaking, is very limited. They all consist of substances possessing antiseptic qualities; such as poultices prepared of turnips, carrots, &c. boiled and mashed; the effervescing cataplasm; or, what is best of all, *carbonic acid gas*, applied by an apparatus similar to that recommended already.

The bruised leaves of fresh hemlock are also serviceable in this view; as is, likewise, the solution of camphor in linseed oil, mentioned above. Some have tried decoctions of astringent vegetables, particularly cinchona, as topical remedies.

It is here more particularly proper to mention the chemical preparation that Dr. Crawford conceived most likely to destroy the cancerous virus, which he had found to consist in an *hepatised ammonia*. His hopes were chiefly founded on the *oxygenated muriatic acid*, diluted with thrice its weight of water, which, by this dilution, gives little pain to cases that are not highly irritable. In some instances, he found that it *corrected the fetor*, and *amended the discharge*; but its good effects were by no means uniform, for it failed entirely in many others. Its operation is still, therefore, a matter of equal uncertainty with most other applications in this disease. How far this acid is to be ventured on internally is to be doubted; and also, if used internally, whether it would produce better effects than any other simple acid.

Though objections may exist to the internal use of oxygenated muriatic acid, it may, nevertheless, as an external application, answer the end of correcting the fetor, which is extremely offensive to the patient, and even injurious; since the effluvia entering the lungs along with the atmospheric air, greatly injures the purity of the latter.

3. To *retard the extension of the ulcer*, is, perhaps, a task of little less difficulty than to effect its diminution; and must consist in an union of the means which we have pointed out as requisite to the several indications. To retard the progress of a disease, we must adopt all the methods that have a tendency towards its cure; and, therefore, in the instance before us, we are called upon to apply not only external, but internal remedies, and also to attend to diet, exercise, and every circumstance by which vigour may be imparted to the constitution, and the general health of the body maintained.

Of the internal remedies most beneficial to a cancerous ulcer, and which have not been already taken in another view, there remain to be mentioned only two, arsenic and iron, of which we have spoken above. With regard to the use of iron, it may truly be said, that it has a very considerable effect in supporting the system, and lessening debility; and it will even produce very flattering appearances in some cancerous sores, more especially those of the face. It is necessary, perhaps, at the same time, to employ the spirituous preparation of the same metal as a *topic*, and, in many cases, it has been attended with the evident effect of *retarding the extension of the cancerous ulcer*. This preparation, except in point of cleanliness of application, possesses no advantage over the *tinctura ferri muriati*, which Mr. Justamond afterwards employed as a substitute. This tincture he applied with a camel's-hair brush upon the thick curling edges of the sore, and to some little distance around it; dressing the ulcer itself with any

other remedy that the state of it might seem to require, but avoiding all greasy applications.

Among the means of retarding the progress of the ulcer, we may also very properly reckon the occasional application of blisters, in the manner already mentioned; and also the use of the *arsenical caustic*, from time to time, to such parts of the ulcer, or of its edges, as are particularly ill-conditioned. It has been said, indeed, that the use of active caustics, as a means of *retarding a cancerous ulcer*, should be adopted with great circumspection. Whatever creates active inflammation, spreads the cancerous poison in an equal proportion; and unless we can qualify our applications in such a way as to destroy *without inflaming* (which cannot but be a difficult, if not an impossible task), we shall run some risque, not only of adding to the patient's present sufferings, but also of spreading mischief to parts not before affected by the disease.

In many common ulcers, however, and sometimes in the cancerous ulcer, there exist parts which, possessing less of life than the surrounding substance, may be destroyed by a prudent management of the caustic, without producing much irritation. There is some difficulty too in the applications we may select for this purpose; yet we have the means of qualifying them by the mixture of other substances capable of adding to that disposition, in certain parts of the ulcer, which we have described as favourable to the insensible operation of a caustic. These substances are not merely such as weaken its proportion as they extend its bulk, but such as act specifically on the animal fibre, and by diminishing its life yet more considerably than before, render it a prey to the escarotic properties of the composition, with only a slight degree of inconvenience to the patient.

The caustic most advisable in this view, therefore, is a mixture of due proportions of the *arsenicum antimoniatum*, opium, and camphor; the proportions being regulated according to the degree of irritability and sensibility existing in the part destined for its action. The additions to the caustic should, at least, be equal to two-thirds of the bulk of the whole; and the proportion of opium should be about double that of the camphor: but all these circumstances must be matter of discretion with the practitioner, as must also the extent of surface to be attacked, the intervals to be allowed between each successive application of the caustic, &c.

We must not close this part of our subject without remarking, that, among the remedies which have been suggested for the improvement of cancerous ulcers, Dr. Saunders has mentioned the internal use of the juice of the well-known plant, called *goose-grass*. Perhaps, this is not unworthy of a trial. It should, however, be given to some extent, and continued for a considerable time, before any favourable effects are to be expected.

4. The last object of our enquiry, is after the means of *restraining hæmorrhages* from the cancerous ulcer; and this may be included in a very few remarks. When a cancerous ulcer is greatly advanced, and the matter it discharges is highly corrosive, the ulceration is not confined to the muscular fibres of the part, but preys also upon the blood-vessels, and every other substance in its way.

In cancers, as well as in most other local diseases in which an unusual quantity of blood is derived to the part, both the arteries and veins become considerably enlarged. Even the veins, when their coats are corroded, will give vent to considerable quantities of blood; but when a branch of an artery is partially destroyed, the hæmorrhage becomes far more serious; and it very often happens, that a repetition of bleeding from this cause, joined to the pre-existing constitutional debility, carries off the patient. Nor need we wonder at this: the artery thus affected, being buried in a diseased mass, cannot be secured by an operation, as in common cases; while, on the other hand, its being *partially*, not wholly, divided, prevents the usual natural cure of hæmorrhage from small arteries, by spontaneous contraction. Its situation admits not of pressure, which, indeed, the indurated state of the surrounding parts would tend greatly to defeat, even if a bandage and compress could be applied. Our chief resource then, though a poor one, is the application of *styptics:* but the patient's life is at stake, and we must attempt *something*.

In applying styptics, we are to consider that the most powerful are, in general, such as give considerable pain, and excite, what to the utmost we should avoid, inflammation. Of this description we may instance the vitriolated metals, particularly copper, spirit of turpentine, alum, and many others included in our dispensatories. Some are of a milder description, but, unhappily, their efficacy diminishes in proportion as they are less stimulating. It is right that we should try the latter, however, and recur to the former only in cases where the hæmorrhage demands a lesser inconvenience, as the price of avoiding a considerable evil.

Some very profuse bleedings, it appears, have been restrained by the application of pounded ice to the part; but in those which call for the use of a decisive remedy, the application of a little of the arsenical caustic to the bleeding vessel, is a step which may very properly be taken, since, by the total obliteration of the vessel (which before was only partially opened by the corrosion of the discharge), a stop may be put to the bleeding for the present, and a subsequent separation of the eschar may prevent any future return of it.

We cannot, however, quit this part of our subject without mentioning an empirical preparation, which, though destitute not only of irritating qualities, but even of astringency to the taste, acts,

nevertheless, as a most powerful *styptic.* We mean the liquid discovered by Mr. Ruspini. Its effects in other instances demonstrate, that, as a means of restraining hæmorrhage from cancerous ulcers, it is worthy of being applied; particularly as it can have no detrimental effect on the part, as the other remedies of this class have, in a greater or less degree.

Cancers *affecting other parts of the body*, require to be separately considered, as demanding peculiar management. That of the *uterus*, a most formidable disease, in which the hemlock bath has been at least *of service*, will be considered under the article Uterus.

Cancer of the lips.—There is a degree of hardness which takes place in the attack of cancer on these parts, which, however, degenerates, more quickly than in glandular parts, into the state of an ulcer. The under lip is much more frequently attacked with cancer than the upper, or indeed than any other part of the body. And as little dependence is to be placed upon external applications or internal remedies, recourse must be had to the knife as the only certain method of cure.

When the disease has not attacked any considerable part of the lip, the diseased part is to be cut out, the sides brought together, and the wound cured by the twisted suture. The operation ought therefore to be performed early, before the loss of substance is too great to allow the parts to be brought properly together. The general steps of the operation are nearly the same as in the operation for hare-lip (see Hare-Lip), and therefore need not be repeated. It is only to be observed, that *all* the diseased parts are to be removed, taking care to make the cut in such a way as will most readily admit of the twisted or hare-lip suture. When the parts can be brought together, the lip will have nearly the same appearance as in the operation for hare-lip; but when the disease spreads over a considerable part of the lip, so as to prevent the sound parts from being united after the diseased parts have been removed, all that can be done is to remove the parts affected, secure the bleeding vessels, and dress the sore like any other recent wound.

Cancer of the penis.—Instances of cancer in this part take place occasionally; and as the exhibition of internal remedies is attended with no better success in this, than in the case of a cancer in any other part of the body, the surgeon must proceed to amputation. The method of doing this is described under the article Penis.

Cancer of the testicle.—In this part the cancerous state is preceded by a long existence of scirrhus. Indeed it is rare that the former state takes place, as recourse is generally had to the removal of the part by an operation, which should not be deferred too long if we would save the patient's life. The circumstances under which it should be performed and the manner of performing it are stated under the article Testis.

Cancer of the eye.—Scirrhus and cancer may arise from repeated inflammations of the eye, or from staphyloma, or some of the other diseases which frequently attack this organ. The symptoms are, an enlargement, hardness, and protrusion of the ball, with a red fungous appearance, sometimes discharging thick yellow matter, but more frequently a thin acrid ichor. At first there is only a sensation of heat in the tumor; but this gradually increasing, changes at last into darting pains, which likewise shoot through to the opposite side of the head. In this situation blood-letting, opiates, and emollient applications may alleviate the pain. A hemlock poultice applied to the eye, and a wash of lime-water, with a little opium dissolved in it, and applied every time the poultice is renewed, give some relief; but although the pain be moderated by these means, it does not prevent the disease from spreading, nor can any thing else but extirpation produce a radical cure.

After the disease is discovered to be cancerous, the operation should be performed without delay, to prevent the parts in the neighbourhood, as well as the constitution at large, from suffering. In performing the operation, the patient should be placed in a proper light, and the head supported by an assistant. If the eyelids are diseased, they must be separated along with the tumor; but where they are sound, they ought to be carefully preserved; and for this purpose they may be kept out of the way by two levatores held by assistants. When the eyeball protrudes considerably, the operator may lay hold of it with his fingers; but if this be impracticable, a broad ligature should be introduced through the centre of it, that it may be the more readily removed from the orbit. Sometimes it will be necessary to enlarge the opening of the eyelids, by cutting the external angle to allow the eyeball to be more readily removed. The whole of the diseased parts are now to be separated by a knife bent so as to correspond with the sides of the orbit, guarding at the same time against wounding the periosteum or the bones of the orbit, which are commonly extremely thin. The eye being in this manner extirpated, the hæmorrhage from the ocular arteries is to be suppressed by means of agaric, or by a bit of sponge; then over this is to be laid soft lint, with a napkin to cover the whole. After suppuration takes place, the dressings are to be removed; when a little lint, applied with an emollient pledget over it, will be sufficient as long as any matter is discharged. After the wound is healed, the deformity may be in some measure obviated by wearing an artificial eye; though it is chiefly in cases where part of the humours of the eye have been evacuated, that this can be used with much

propriety; for when the orbit is empty the artificial eye sinks too far into it.

Cancer of the stomach.—We have melancholy proofs of the existence of this disease, which, being beyond the reach of our art, it is sufficient, if not superfluous, merely to mention. It is the duty of practitioners, however, to avail themselves of every opportunity of determining the precise nature of such disorders by dissection, and of communicating them to the public. Mr. Fearon speaks of five cancerous affections of the stomach, in his collection of diseased parts; much more extensive than any that he has met with in other collections, or read of either in Morgagni, Bonetus, or any other author.

Mr. Pott describes under the name of *cancer*, an affection of the scrotum which is peculiar to chimney-sweepers. Of this, which is popularly called the *chimney-sweeper's wart*, an account is given in the article SCROTUM.

CANCER. *Chelæ cancrorum*, *oculi cancrorum*, or *lapides cancrorum*, are produced from the shell of this animal, the CRAB. The shell-fish so called is the *cancer ostacus* of Linnæus; the officinal preparations are nevertheless obtained also from the *cancer gammarus*, *macurus*, and the *pagarus* of Linnæus. The colleges have retained the *chelæ cancrorum*, and several compounds of them; as the *pulvis e chelis cancrorum compositus*, the *pulvis contrayervæ compositus*, the *trochisci e creta*, and the *confectio aromatica*. Crab's-claws, and crab's-eyes, as they are called, which are cerebral concretions, are of a calcareous quality, and consequently possess antacid virtues. They are exhibited in pyrosis, diarrhœa, and infantile convulsions from acidity, but their powers are inconsiderable.

CA'NCER MUNDITO'RUM; the CHIMNEY-SWEEPERS' CANCER. See SCROTUM.

CANCRO'RUM CHE'LÆ. See CANCER.

CANCRO'RUM O'CULI. See CANCER.

CANDELA'BRUM, a species of the CEROPEGIA.

CANDELA'RES, the name of an order described in the early editions of Linnæus's fragments of a natural method. It consists of the following genera: *rhizophora*, mangrove; (the *candel* or *kandel* of the *hortus malabaricus*); *nyssa* and *mimusops*. These are removed, in the later editions, into the order HOLERACEÆ, which see.

CANDELA'RIA. See VERBASCUM.

CA'NDOR, the whites; a disease incident to trees. See the article VARIETAS.

CA'NDUM, or CANTHUM, sugar-candy.

CANDY CARROT. See DAUCUS CRETICUS.

CANE'LLA ALBA, (*Canella*, dim. of *canna*, a reed; so named because the pieces of bark are rolled up in the form of a reed); the LAUREL-LEAVED CANELLA, or *cortex winteranus spurius*. It is the *canella alba* Linn. Class, *dodecandria*. Order, *monogynia*. The calyx is three-lobed; the petals are five; the antheræ 16, growing to an urceolated or bladder-shaped nectarium; and the fruit is a trilocular berry, with two seeds. There is but one species, the *alba*; which grows in the West Indies, usually about 20 feet high, and eight or ten inches in thickness, in the thick woods of most of the Bahama islands. The leaves are narrow at the stalk, growing wider at their ends, which are broad and rounding, having a middle rib only; they are very smooth, and of a light shining green. In May and June the flowers, which are pentapetalous, come forth in clusters at the ends of the branches: they are red, and very fragrant, and are succeeded by round berries, of the size of large peas, green, and when ripe (which is in February) purple, containing two shining black seeds, flat on one side, otherwise not unlike in shape to a kidney bean: these seeds in the berry are enveloped in a slimy mucilage. The whole plant is very aromatic, the bark particularly, being more used in distilling, and in greater esteem, in the northern parts of the world than in Britain.

The bark is the canella alba of the shops. It is brought to us rolled up into long quills, thicker than cinnamon, and both outwardly and inwardly of a whitish colour, lightly inclining to yellow. Infusions of it in water are of a yellowish colour, and smell of the canella; but they are rather bitter than aromatic. Tinctures in rectified spirit have the warmth of the bark, but little of its smell. Proof-spirit dissolves the aromatic as well as the bitter matter of the canella, and is therefore the best menstruum.

The canella is the interior bark freed from an outward thin rough one, and dried in the shade. The shops distinguish two sorts of canella, differing from each other in the length and thickness of the quills: they are both the bark of the same tree; the thicker being taken from the trunk, and the thinner from the branches. This bark is a warm pungent aromatic, though not of the most agreeable kind; nor are any of the preparations of it very grateful.

Canella alba is often employed where a warm stimulant to the stomach is necessary, and as a corrigent of other articles. It is now, however, but little used in composition by the London college; the only officinal formula which it enters being the pulvis aloeticus: but in the Edinburgh Pharmacopœia it is more frequently noticed. It is not only a good and cheap aromatic, but very suitable for covering the taste of some other articles.—This bark has been confounded with that called winter's bark, which belongs to a very different tree. See WINTERA. The Dublin College name it *winterania canella*. It is an ingredient in the tinct. gentian. comp. *Edin.*

CANE'LLÆ MALBARICÆ CORTEX. See Cassia lignea.

CANI'NANA, the name of a species of serpent found in America, and esteemed one of the less poisonous kinds. It grows to about two feet long; and is green on the back, and yellow on the belly. It feeds on eggs and small birds; the natives cut off the head and tail, and eat the body as a delicate dish. Authors do not describe the symptoms produced by the bite of this animal.

CANINE, whatever partakes of, or has any relation to, the nature of a dog.

CANINE APPETITE, the same with bulimia. See Bulimia.

CANINE MADNESS, or hydrophobia. See Hydrophobia.

CANI'NI, a name given to two teeth in each jaw, one on each side the incisores. They are pretty thick and round, and end in a sharp point. They have each one root, which is longer than the roots of the incisores. Their proper use is to pierce the solid aliments; because the fore-teeth are not only apt to be pulled outwards by the things we hold and break with them, but likewise because they are less subject to blows than the molares: therefore above two thirds of them are buried in their alveoli, or sockets, by which their resistance of all lateral pressures is much greater than that of the molares. The late Mr. John Hunter, in his *Natural History of the Human Teeth*, names these *cuspidati*, because they have the two sides of their edge sloped off to a point, and, this point is very sharp. Their fangs are longer than those of the incisores; and, from their fangs being supposed to extend the greatest part of the way to the eye-teeth, they have been called the eye-teeth. See Teeth.

CANI'NI MINORES. The musculi incisorii laterales sometimes send a few fibres to the musculi canini, which Winslow gives the above name to.

CANI'NUS, (*sc. musculus;* because it arises near the canine or eye-tooth) See Levator anguli oris.

CANI'RAM, a name of the Nux Vomica.

CANI'TIES, greyness of the hair, or that change of its natural colour which induces us to say the wearer is grey-headed.

CA'NCRUM O'RIS, (from *cancer*, a spreading ulcer); canker of the mouth, called also *aphthæ serpentes*, *gangrena oris*, &c. a name given to any deep, foul, irregular, fœtid ulcer, with jagged edges, which appears upon the inside of the lips and cheeks; and is attended with a copious flow of offensive saliva. This is seldom seen in adults, but it most commonly attacks children. When the ulceration begins at the inner part of the lip, it exhibits a deep narrow sulcated appearance, and quickly spreads along the inside of the cheek, which becomes hard, and tumefied externally. The gums are very frequently affected, the teeth are generally loose and diseased; matter is often found in the sockets, and abscesses sometimes burst externally through the cheek, the lip, or a little below the maxilla inferior: and it is not uncommon to see an exfoliation of the alveolar processes, or even of the greater part of the lower jaw. Among the children of poor people, where this disease is often neglected or mismanaged at the beginning, a gangrene will sometimes supervene.

In order to obtain a cure, it will be proper to remove any constitutional debility that may exist, by giving the Peruvian bark, sarsaparilla, elm-bark, and the mineral acids. External applications may be preparations of copper; diluted mineral acids; burnt alum; decoction of bark, with vitriolic acid or borax; lime-water with tincture of myrrh, &c.

CA'NNA, Indian flowering-reed; a genus in Linnæus's botany. He enumerates three species.

CANNABI'NA. So Tournefort named the Datisca.

CA'NNABIS, (καννᾶβις, or καννᾶβος; from καννα, *a reed.* Καννᾶβοι are foul springs, wherein hemp, &c. grow naturally. Or from *kanaba*, from kanah, to mow. Arab.); hemp. This plant, the *cannabis sativa* Linn. has a rank smell of a narcotic kind. The effluvia from the fresh herb is said to affect the eyes and head, and that the water in which it has been long steeped is a violent poison. Hemp seeds, when fresh, afford a considerable quantity of oil. Decoctions and emulsions of these have been recommended against coughs, ardor urinæ, &c. but they are fallen into disuse.

CA'NNABIS SATIVA; the systematic name of the hemp plant. See Cannabis.

CA'NTACON, a name for the garden-saffron.

CA'NULA, (dim. of *canna*, a reed); a tube adapted to a sharp instrument, with which it is thrust into a cavity or tumor, containing a fluid: the perforation being made, the sharp instrument is withdrawn and the canula left, in order that the fluid may pass through it. The canula of a trochar, used in tapping the abdomen, is a familiar instance.

CANTHA'RIDES, (from κανθαρος, *a beetle*, to whose tribe it belongs); Spanish flies. *Meloë vesicatorius* of Linnæus. The importance of these flies, by their stimulant, corrosive, and epispastic qualities, in the practice of physic and surgery, is very considerable; indeed, so much so, as to induce many to rank them among the most powerful medicines in the materia medica. These flies have a longish, green, and shining-gold body, with flexible green-striped elytra, which cover the whole back of the body, and under which are closely folded their brown membranous wings. On the head, they have two black articulated feelers. They are found on the fraxinus, sambucus, salix, ligustrum, &c. in Spain, Italy, France, and Germany. The largest come from Italy, but the Spanish can-

tharides are generally preferred. They are gathered by shaking the trees on which they are found, and catching them on a cloth spread beneath it. They are then killed by the fumes of sulphur or vinegar, and dried in a stove. The *melolontha vitis* is sometimes found mixed in considerable numbers with the cantharides. They are easily distinguished by their almost square bodies; and as probably they do not stimulate the skin, they should be picked out before the cantharides are pulverised for use.

It is said the analysis of cantharides, notwithstanding the experiments of Messrs. Thouvenel and Beaupoil, is still extremely imperfect. Lewis ascertained that their active constituent part is entirely soluble both in water and in alkohol, for extracts made with each of these solvents were found to blister, as far as could be judged, equally, and as effectually as cantharides in substance. Both the residua were inactive. Neumann got from 1920 grains, 920 of watery, and afterwards 28 of alkoholic extract; and inversely 400 of alkoholic, and 192 of watery.

These insects have a peculiarly nauseous smell, and are extremely acrid and burning to the taste. If taken internally, they will often occasion a discharge of blood by urine, with exquisite pain: if the dose be considerable, they seem to inflame and exulcerate the whole intestinal canal; the stools become mucous and purulent; the breath fetid and cadaverous; intense pains are felt in the lower belly: the patient faints, grows giddy, delirious, and dies. Applied to the skin, they first inflame, and afterwards excoriate the part, raising a more perfect blister than any of the vegetable acrid substances known, and occasioning a more plentiful discharge of serum. But even the external application of cantharides is often followed by a strangury, accompanied with thirst, heat, and other febrile symptoms.

Strangury and other inconveniences arising from the use of cantharides, whether taken internally, or applied externally, are best obviated by drinking plentifully of emollient liquids, such as milk, almond emulsion, whey, &c. The specific property of counteracting cantharides ascribed to camphor, has been denied by Dr. Cullen and others.

Dr. Andrew Duncan says the internal use of cantharides is at all times a doubtful practice, and requires the most prudent management. They have, however, been sometimes employed with success in dropsy, and in diseases of the urinary organs, arising from debility. They are given in substance in very small doses, or in tincture.

When applied externally, they may be rendered one of the best and most powerful of medical remedies. By proper management, they may be regulated so as first to act merely as a gentle stimulus, then as a rubefacient, and lastly as a blister.

Blisters are applied with a view, 1. To increase the activity of the system in general, by means of their irritation. 2. To increase the activity of a particular organ. 3. To diminish morbid action in particular organs, by means of the irritation they excite in distant parts to which they are applied. Blisters are universally employed in almost all diseases accompanied with typhus fever, especially if any important viscus, as the brain, lungs, or liver, be at the same time particularly affected. In these cases the blisters are not applied to the diseased organs themselves, but as near to them as may be convenient. When we wish to excite action in any organ, the application is made, if possible, directly to the diseased part.

Cantharides are employed externally, either in substance, mixed up with wax and resin, so as to form a plaster or ointment, or in the form of tincture. The following are the officinal formulæ.

Tinctura Cantharidis. Lond.

Take of Bruised cantharides, two drachms;
Cochineal, powdered, half a drachm;
Proof spirit, one pint and a half.
Digest for eight days, and strain the tincture.

This contains the active principle of the cantharides, is applied externally as a stimulant and rubefacient, and sometimes given internally, in doses of from ten to twenty drops, as a diuretic.

Tinctura Meloes Vesicatorii. Edin. Dubl.

Take of Cantharides, bruised, one drachm;
Proof spirit, one pound.
Mix and digest for seven days; then strain through paper. *Tinctura Cantharidum* is the name given to this by the Dublin College.

Unguentum Cantharidis. Lond. Dubl.

Take of Cantharides, powdered, two ounces;
Distilled water, eight ounces,
Ointment of yellow resin, eight ounces.

Boil the water with the cantharides to one half, and strain. To the strained liquor add the ointment of yellow resin. Evaporate this mixture to the thickness of an ointment in a water-bath, saturated with sea-salt.

Unguentum Infusi Meloes Vesicatorii. Edin.

Take of Cantharides,
White resin,
Yellow wax, of each one part;
Hog's lard,
Venice turpentine, of each two parts;
Boiling water, four parts.

Infuse the cantharides in the water for a night; then strongly press out and strain the liquor, and boil it with the lard till the water be consumed; then add the resin and wax; and when these are melted, take the ointment off the fire and add the turpentine.

These formulæ, which contain the soluble parts of the cantharides, uniformly blended with the other ingredients, are more commodious, and in general occasion less pain, though little less effectual in their action, than the compositions with the fly in subtance. This, however, does not uniformly happen; and therefore the Edinburgh college introduce the following:

Unguentum Pulveris Meloes Vesicatorii. Edin.

Take of Resinous ointment, seven parts;
Powdered cantharides, one part.
Mix them effectually.

This ointment is employed in the dressing for blisters called *perpetual*, or to be kept running for a considerable time, which, in many cases, is of great service. Particular care should be taken, that the cantharides employed in these compositions be reduced into very subtile powder, and that the mixture be made as equal and uniform as possible. With these precautions, there are some particular habits in which this ointment operates with even less pain than the former, without being less effectual.

Ceratum Cantharidis. Lond.

Take of Cerate of spermaceti, softened with heat, six drachms;
Spanish flies, finely powdered, one drachm.
Mix them.

In this cerate the Dublin College direct four scruples of the flies to one ounce. Under this form cantharides may be made to act to any extent that is requisite. It is particularly more convenient where the skin to which the blister is to be applied is previously much affected, as in cases of small pox; and in supporting a drain under the form of an issue, it is less apt to spread than the softer ointment.

Emplastrum Cantharidis. Lond. Dubl.

Take of Spanish flies, finely powdered, one pound;
Wax plaster, two pounds;
Prepared hog's lard half a pound.
Having melted the plaster and lard, sprinkle and mix in the flies, a little before they become firm.

Emplastrum Meloes Vesicatorii. Edin.

Take of Mutton suet,
Yellow wax,
White resin,
Cantharides, of each equal weights.

Mix the cantharides, reduced to a fine powder, with the other ingredients, previously melted, and removed from the fire.

Both these formulæ are very well suited to answer the intention of exciting blisters. When the desired effect does not take place, it is to be ascribed to their activity having been destroyed by some accidental circumstance; such as too great heat in forming, or in spreading, the plaster. It is therefore not unusual to sprinkle powder of cantharides on the blister after it is spread.

Emplastrum Meloes Vesicatorii Compositum. Edin.

Take of Burgundy pitch,
Venice turpentine,
Cantharides, each twelve parts;
Yellow wax, four parts;
Sub-acetite of copper, two parts;
Mustard seed,
Black pepper, each one part.

Having first melted the pitch and wax, add the turpentine, and to these, in fusion, and still hot, add the other ingredients, reduced to a fine powder, and mixed, and stir the whole carefully together, so as to form a plaster.

This is reckoned the most infallible blistering plaster; as it includes a variety of stimulating ingredients, which may supply any accidental deficiency of power in the principal one.

CA'NTHUS, (κανθος, *the iron binding of a cart wheel)*; the angle or corner of the eye, where the upper and under eyelids meet. That next the nose is termed the internal or greater canthus, and the other, the external or lesser canthus.

CAOUTCHOUC, commonly called ELASTIC GUM, *India rubber*, or *Cayenne resin.* It is prepared from the milky juice of the *Siphonia elastica foliis ternatis elliptisis integerrimis subtus canis longe peliolatis.* This substance is brought from Cayenne and other parts of South America, and is possessed of the most singular properties. No substance is yet known which is so pliable, and at the same time so elastic; and it is farther a matter of curiosity, as being capable of resisting the action of very powerful menstrua. From the account of M. de la Condamine, we learn, that this substance oozes out, under the form of a vegetable milk, from incisions made in the tree; and that it is ga-

thered chiefly in time of rain, because, though it may be collected at all times, it flows then most abundantly. The means employed to inspissate and indurate it, M. de la Borde says, are kept a profound secret. M. Bomere and others affirm, that it thickens and hardens gradually by being exposed to the air; and as soon as it acquires a solid consistence, it manifests a very extraordinary degree of flexibility and elasticity. Accordingly the Indians make boots of it, which water cannot penetrate, and which, when smoked, have the appearance of real leather. Bottles are also made of it, to the necks of which are fastened hollow reeds, so that the liquor contained in them may be squirted through the reeds or pipes by pressure. One of these, filled with water, is always presented to each of the guests at their feasts, who never fail to make use of it before eating. This whimsical custom led the Portuguese in that country to call the tree that produces this resin *pao de xirringa*, and hence the name of *seringat* is given both to the tree and to its resinous production. Flambeaux, an inch and a half in diameter, and two feet long, are likewise made of this resin, which give a beautiful light, have no bad smell, and burn twelve hours. A kind of cloth is also prepared from it, which the inhabitants of Quito apply to the same purpose as our oil-cloth and sail-cloth. It is formed, in fine, by means of moulds, into a variety of figures for use and ornament; and the process is said to be thus: The juice, which is obtained by incision, is spread over pieces of clay formed into the desired shape; and as fast as one layer is dry, another is added, till the vessel be of the proper thickness: the whole is then held over a strong smoke of vegetables on fire, whereby it hardens into the texture and appearance of leather; and before the finishing, while yet soft, is capable of having any impression made on the outside, which remains ever after. When the whole is done, the inside mould is picked out, and thus is produced the elastic bottle so useful to surgeons.

Ever since this resin has been known in Europe, its chemical qualities and other extraordinary properties have been very diligently investigated. In particular it has been endeavoured to discover some method of dissolving it in such a manner that it would assume different figures with equal ease as when in its original state of milk. In the Memoirs of the Academy of Sciences for 1768, we have an account of several attempts for this purpose, and how it may be effected: and Mr. Macquer, after a variety of fruitless trials, found that the caoutchouc, if cut into little bits, and put into a proper vessel with as much ether as was sufficient to cover it, would perfectly dissolve with the heat of the atmosphere. He observes, however, that two pints of the best ether, obtained by rectifying eight or ten pints of the common ether by a gentle heat, must be used, in order to the success of the operation. The distinguishing properties of this substance, viz. its solidity, flexibility, and elasticity, and its quality of resisting the action of aqueous, spirituous, saline, oily, and other common solvents, render it extremely fit for the construction of tubes, catheters, and other instruments, in which these properties are wanted. In order to form this resin into small tubes, Mr. Macquer prepared a solid cylindrical mould of wax, of the desired size and shape; and then dipping a pencil into the ethereal solution of the resin, daubed the mould over with it, till he had covered it with a coat of resin of a sufficient thickness. The whole piece is then thrown into boiling water; by the heat of which the wax is soon melted, and rises to the surface, leaving the resinous tube completely formed behind.

Mr. Berniard, who has made a variety of experiments on this substance, concludes that it is a peculiar fat oil, coloured by a matter soluble in alkohol, and contaminated with the soot of the smoke to which each layer of the resin must be exposed, in order to dry it. According to this chemist, water produces no alteration upon it: alkohol, assisted by a boiling heat, discolours it. Caustic fixed alkali is incapable of acting upon it. The concentrated sulphuric acid reduces it to a carbonaceous state, and is itself, at the same time, tinged with a black colour, and takes the smell and volatility of the sulphurous acid. The common or weak nitric acid acts on this resin in the same way as on cork, and gives it a yellow colour; the nitric acid, strongly concentrated, decomposes it very rapidly; the muriatic acid produces no sort of alteration upon it; rectified sulphuric ether did not dissolve it. The author observes, that this fact must appear singular to all those who know the accuracy and veracity of Macquer. Nitric ether did dissolve it. This solution is yellow, and affords, by evaporation, a transparent substance, friable, and soluble in alkohol—in a word, a genuine resin, formed, according to this author, by the action of the nitric acid on the elastic caoutchouc. The volatile oils of lavender, aspic, and turpentine, dissolve it with the help of a gentle heat; but they form clammy fluids, which stick to the hands, and cannot therefore be applied to any useful purpose. A solution of elastic resin by *oil of aspic*, when mixed with alkohol, deposited white flakes, which were insoluble in hot water, but floated on the surface of that fluid, and became, on cooling, white and solid like wax; in a word, they formed a genuine, fixed, concrescible oil. Oil of camphor dissolved elastic resin by simple maceration. When the solution was evaporated, the camphor was volatilized; and there remained in the capsule an amber-coloured matter, of a firm consistence, but scarce gluey, and easily soluble in alkohol. Fixed oils, when

boiled upon elastic resin, dissolve it: wax likewise dissolves it. This substance does not melt by a boiling heat; but when exposed to the action of fire in a silver spoon, it is reduced into a thick black oil: it then exhales white vapours; after which it remains fat and clammy, though exposed to the air for several months; nor does it ever again recover its dryness and elasticity, which are so necessary to fit it for the purposes to which it is applied. M. Berniard concluded his experiments on this substance, by analysing it by a naked fire. From an ounce of elastic gum he obtained a very little phlegm; an oil, which, though at first clear and light, became afterwards thick and coloured; and ammoniac, the quantity of which he does not specify: there remained a coal, similar to those of other resinous substances, which weighed 12 grains. This chemist ascribes the origin of the ammoniac to the soot which colours the gum. It may be necessary to remark with respect to this analysis, that it does not determine, in a very accurate manner, the nature of elastic resin: for acids act not on this substance in the same way as on fat oils; they act on these bodies with much more rapidity than on elastic gum: neither do caustic alkalis reduce it to a saponaceous state; nor does it melt, unless a much stronger heat be applied to it than what is sufficient to reduce the most solid fixed oils to a state of fluidity: and, besides, no fixed oil ever becomes dry and elastic like caoutchouc.

A resin similar to this was some years ago discovered by M. Poivre, in the isle of France; and there are various milky juices extracted from trees in America and elsewhere, which, by previous mixtures and preparations, are formed into an elastic resin, but of an inferior quality to that of Cayenne: such, for instance, are the juices obtained from the *Cecropia peltata*, the *Ficus religiosa*, and *indica*, &c. Of the genuine trees, those growing along the banks of the river of the Amazons are described by Mr. Condamine as attaining a very great height, being at the same time perfectly straight, and having no branches except at the top, which is but small, covering no more than a circumference of ten feet. Its leaves bear some resemblance to those of the *manioc:* they are green on the upper part, and white beneath. The seeds are three in number, and contained in a pod consisting of three cells, not unlike those of the *ricinus* or *palma Christi;* and in each of them there is a kernel, which, being stripped and boiled in water, produces a thick oil or fat, answering the purposes of butter in the cookery of that country.

This elastic gum, however, may be dissolved without ether, and answer the purposes of a varnish, if managed in the following way: Take one pound of the spirit of turpentine, and a pound of the gum cut into very small pieces; pour the turpentine into a long-necked matrass, which must be placed in a sand-bath; throw in the gum, not all at once, but by little and little according as it is perceived to dissolve. When it is entirely dissolved, pour into the matrass a pint of nut or linseed oil, or oil of popples, rendered desiccative in the usual manner with litharge. Then let the whole boil for a quarter of an hour, and the preparation is finished. This would make an excellent varnish for air-balloons, were it not so expensive on account of the price of the gum. Another method, invented by Mr. Baldwin, is as follows: Take any quantity of the caoutchouc, as two ounces avoirdupois: cut it into small bits with a pair of scissars. Put a strong iron ladle (such as plumbers or glaziers melt their lead in) over a common pit-coal or other fire. The fire must be gentle, glowing, and without smoke. When the ladle is hot, much below a red heat, put a single bit into the ladle. If black smoke issues, it will presently flame and disappear; or it will evaporate without flame: the ladle is then too hot. When the ladle is less hot, put in a second bit, which will produce a white smoke. This white smoke will continue during the operation, and evaporate the caoutchouc: therefore no time is to be lost; but little bits are to be put in, a few at a time, till the whole are melted. It should be continually and gently stirred with an iron or brass spoon. Two pounds, or one quart, of the best drying oil (or of raw linseed oil, which, together with a few drops of neats-foot oil, has stood a month, or not so long, on a lump of quick lime, to make it more or less drying) is to be put into the melted caoutchouc, and stirred till hot: and the whole poured into a glazed vessel, through a coarse gauze, or fine sieve. When settled and clear, which will be in a few minutes, it is fit for use either in a hot or cold state.

The Abbé Clavigero informs us, that the elastic gum is called by the Mexicans *olin* or *olli*, and by the Spaniards of that kingdom *ule:* that it distils from the *olquahuitl*, which is a tree of moderate size; the trunk of which is smooth and yellowish, the leaves pretty large, the flowers white, and the fruit yellow and rather round, but angular; within which there are kernels as large as filberds, and white, but covered with a yellowish pellicle: that the kernel has a bitter taste, and the fruit always grows attached to the bark of the tree: that when the trunk is cut, the *ule* which distils from it is white, liquid, and viscous; afterwards it becomes yellow; and lastly of a leaden colour, though rather blacker, which it always retains. The tree, he adds, is very common in the kingdom of Guatimala.

As to the genus of this tree, it does not seem to be yet ascertained. Aublet, in his *Histoire des Plantes de la Guienne*, describes the tree, the fruit, and manner of collecting the juice; but never saw the flower: he calls it, however, *Hevea Guianensis*.

In Jacquin's America, it is called *Echites corymbosa.* The younger Linnæus, in his *Supplementum Plantarum* (p. 422), names it *Jatropha elastica;* but acknowledges that he only gives it this name from the structure of the fruit having most resemblance to that genus, his dry species wanting the flowers.

With us the caoutchouc is used for various medical purposes. Surgeons have excellent bougies and catheters made of it, and bag-syringes for injecting liquids. It also serves as a pessary in cases of prolapsus uteri, &c.

CAPA'IVA BALSAM. See BALSAMUM COPAIVÆ.

CAPER BUSH. See CAPPARIS.

CAPHO'RA, a name for camphor.

CAPHU'RA BA'ROS INDO'RUM, a species of camphor which separates from the *Ol. Caphuræ* on redistilling it.

CAPHU'RÆ OLEUM, an aromatic essential oil, distilled from the root of the cinnamon tree.

CAPICATI'NGA, a species of acorns which grow in the West Indies, larger and more useful than ours in Europe, of the same qualities, but in a greater degree.

CAPICATI'NGA, Asiatic sweet-flag.

CAPILLAME'NTUM, the hairy or villous integument belonging to animals.

CAPILLA'RES, (from *capillus*, hair), in botany, capillary, or hair-shaped, plants; the name of a class in Morison, Ray, and Boerhaave, consisting of those imperfect plants called ferns. This corresponds to the sixteenth class in Tournefort's System, and to the first order *Filices*, of the class *Cryptogamia*, in the Sexual Method of Linnæus. See FILICES, and CRYPTOGAMIA.

CAPILLARY, in a general sense, an appellation given to things on account of their extreme fineness, resembling hair. This epithet is given by anatomists to the most minute blood-vessels, and fibres, canals of the human body. See CAPILLARY VESSELS.

CAPILLARY TUBES, in physics, are small pipes of glass, whose canals are extremely narrow, their diameter being only a half, a third, or a fourth of a line. The ascent of water, &c. in capillary tubes is a phenomenon that has long embarrassed the philosophers: for let one end of a glass tube, open at both extremities, be immerged in water, the liquor within the tube will rise to a considerable height above the external surface: or if two or more tubes are immerged in the same fluid, one a capillary tube, and the other of a larger bore, the fluid will ascend higher in the former than in the latter; and this will be in a reciprocal ratio of the diameters of the tubes.

In order to account for this phenomenon, it will be necessary first to premise, that the attraction between the particles of glass and water is greater than the attraction between the particles of water itself; for if a glass tube be placed in the position parallel to the horizon, and a drop of water be applied to the under side of the tube, it will adhere to it; nor will it fall from the glass till its bulk and gravity are so far increased, as to overcome the attraction of the glass. Hence it is easy to conceive how sensibly such a power must act on the surface of a fluid, not viscid, as water, contained within the small cavity or bore of a glass tube; as also that it will be proportionably stronger as the diameter of the bore is smaller; for it will be evident that the efficacy of the power is in the inverse proportion of the diameter, when it is considered, that such particles only as are in contact with the fluid, and those immediately above the surface, can effect it.

Now these particles form a periphery contiguous to the surface, the upper part of which attracts and raises the surface, while the lower part, which is in contact with it, supports it: so that neither the thickness nor length of the tube is of any consequence here; the periphery of particles only, which is always proportionable to the diameter of the bore, is the only acting power. The quantity of the fluid raised will therefore be as the surface of the bore which it fills, that is, as the diameter; for otherwise the effect would not be proportional to the cause, since the quantities are always as the ratio of the diameters; the heights therefore to which the fluids will rise, in different tubes, will be inversely as the diameters.

Some doubt whether the law holds throughout, of the ascent of the fluid being always higher as the tube is smaller: Dr. Hook's experiments, with tubes almost as fine as cobwebs, seem to show the contrary. The water in these, he observes, did not rise so high as one would have expected. The highest he ever found it, was at twenty-one inches above the level of the water in the bason; which is much short of what it ought to have been by the law above-mentioned.

CAPILLARY VESSELS, (*vasa capillaria*; from *capillus*, a little hair; so called from their resemblance to hairs or fine threads); those very fine ramifications of the arteries, which terminate upon the external surface of the body, or on the surface of internal cavities.

CAPI'LLUS, (*quasi capitis pilus*, the hair of the head), human HAIR. It consists of small cylindrical, transparent, insensible, and elastic filaments, which arise from the skin, and are fastened in it by means of small roots. Hair is composed of a spongy, cellular texture, containing a coloured liquid, and a proper covering. It is divided into two kinds: *long*, which arises on the scalp, cheek, chin, breasts of men, the anterior parts of the arms and legs, the arm-pits, groins, and pelvis; and

short, which is softer than the long, is present over the whole body, except only the palm of the hand and sole of the foot. The hair originates in the adipose membrane from an oblong membranous bulb, which has vessels peculiar to it. The hair is distinguished by different names in certain parts: as, *capillus*, on the top of the head; *crinis*, on the back of the head; *circrinnus*, on the temples; *cilium*, on the eyelids; *supercilium*, on the eyebrows; *vibrissa*, in the nostrils; *barba*, on the chin; *pappus*, on the middle of the chin; *mystax*, on the upper lip; *pilus*, on the body. The hair is apt to fall off in consequence of a want of nourishment at the roots; this is to be prevented by the application of stimulants, both medical and mechanical. The hair is likewise subject to a peculiar disease named Plica polonica. See PLICA.

CAPI'LLUS, in botany, a term of measure, or dimension. See MENSURA. It may be observed, that Linnæus calls the calyx of the female flowers of the *typha*, or cat's-tail, *capilli papposi*, downy hairs. See PAPPUS.

CAPI'LLUS VE'NERIS. See ADIANTHUM.

CAPI'STRUM, a bandage for the head, formerly so called. In Vogel's Nosology it is the same as TRISMUS.

CAPITA'TÆ, the name of a class in Ray's Method, and of a division, or section, in Linnæus's arrangement of the compound flowers, which constitute the forty-ninth order in his Fragments of a Natural Method. See COMPOSITÆ.

CAPITA'TUS FLOS, (from *caput*, a head), in botany, a fructification, generally consisting of many flowers firmly connected on the summits of the foot-stalk, so as to form a knob, or head. It is exemplified in *gomphrena*, globe amaranthus. See CAPITULUM.

CAPI'TULUM, in botany, a little head. This is a mode of inflorescence, in which many flowers are collected into a head, at the extremity or summits of the foot-stalk; as in globe amaranthus. A *Capitulum* is either:—*Dimidiatum*, i.e. halved; resembling half a head, or hemispherical; as in *lippia hemispherica*: *Foliosum*, leafy, intermixed with leaves: *Globosum*, round, of a globular form; as in globe amaranthus: *Hispidum*, bristly; as in field basil, *clinopodium vulgare*: *Nudum*, naked, or having no leaves, as opposed to *foliosum*: *Ovatum*, egg-shaped; as in *lippia ovata*: *Pedunculatum*, furnished with pedicelli, or little foot-stalks; as in *teucrium capitatum*: *Pyramidatum*, shaped like a pyramid; as in *lippia Americana*: *Sessile*, having no peduncles or flower-stalks; as in *teucrium pumilum*: *Subrotundum*, roundish; as in *selago fruticosa*. We must also observe, that the antheræ of the mosses are stiled by Linnæus, CAPITULA. *Phil. Bot.* p. 223.

CA'PO, a CAPON; that is, a cock-chicken, gelded as soon as left by the dam, or as soon as he begins to crow. Capons are of use to lead chickens, ducklings, pheasants, &c. and defend them from the kites and buzzards; but they are more commonly fed for the table. They are reckoned more delicate than either a cock or a hen, and their flesh is tenderer and more digestible. See BIRDS.

CA'PPARIS, (καππαρις; from CABAR, Arab. or παρα το καππανειν αραν; from its curing madness and melancholy), the common CAPER-BUSH. The buds or unexpanded flowers of this plant, *capparis spinosa; pedunculis solitariis unifloris, stipulis spinosis, foliis annuis, capsulis ovalibus*, of Linnæus; Class, *Polyandria;* Order, *Monogynia;* are in common use as a pickle, which is said to possess antiscorbutic virtues. The bark of the root was formerly in high esteem as a deobstruent medicine.

CA'PPARIS SPINO'SA; the systematic name of the caper plant. See CAPPARIS.

CA'PRA, the GOAT, a genus of quadrupeds belonging to the order of *pecora*. Of this genus fourteen species are described by Linnæus. The qualities of the flesh of this animal as aliment are spoken of under ANIMAL FOOD. In mountainous situations it affords a cheap and plentiful provision, especially in the winter months, when the kids are brought to market. The haunches of the goat are frequently salted and dried, and supply all the uses of bacon: this, by the Welsh, is called *coch yr wden*, or hung venison. The milk of the goat is reckoned sweet and nourishing, and an excellent succedaneum for ass's milk. Yet Dr. Cullen says, "*Goat's* milk is less fluid, less sweet, less flatulent than cow's; has the largest proportion of insoluble parts after coagulation, and indeed the largest proportion of the coagulable part. Its oily and coagulable parts are not spontaneously separable, never throwing out a cream, or allowing butter to be readily extracted from it. Some of this animal's milk, with a tea-spoonful of hartshorn, drank warm in bed in the morning, and at four in the afternoon, and repeated for some time, has been said to cure some phthisical cases before they were gone too far. The cheese which is made of goat's milk, though much valued in some of the mountainous countries, has, however, a peculiar taste and flavour, not very generally approved of. See CHEESE.

CAPRA'RIA, SWEET-WEED, a genus in Linnæus's botany. He enumerates five species.

CAPREOLA'RIA, a term applied to the *vasa spermatica*, from *capreolus*, the tendril of a vine.

CAPREOLA'TA, a species of BLACK BRIONY, growing in Brasil.

CAPRE'OLUS, in anatomy, a term used for the helix of the ear.

CAPRIFICA'TIO, (from *caprificus*, a wild fig), CAPRIFICATION; a method used in the Levant, for ripening the fruit of the domestic fig-tree, by means of insects bred in that of the wild fig-tree. The most ample and satisfactory accounts of this curi-

ous operation are those of Tournefort and Pontedera; the former, in his voyage to the Levant, and in a Memoir delivered to the academy of sciences at Paris in 1705; the latter, in his *Anthologia*. The substance of Tournefort's account is this: "Of the thirty species or varieties of the domestic fig-tree which are cultivated in France, Spain, and Italy, there are but two cultivated in the Archipelago. The first species is called *ornos*, from the old Greek ερινος, which answers to *caprificus* in Latin, and signifies a wild fig-tree. The second is the domestic or garden fig-tree. The former bears successively, in the same year, three sorts of fruit called *fornites*, *cratitires*, and *orni*; which, though not good to eat, are found absolutely necessary towards ripening those of the garden fig. These fruits have a sleek even skin; are of a deep green colour; and contain in their dry and mealy inside, several male and female flowers placed upon distinct foot-stalks, the former above the latter. The *fornites* appear in August, and continue to November without ripening: in these are bred small worms, which turn to a sort of gnats no where to be seen but about these trees. In October and November, these gnats of themselves make a puncture into the second fruit, which is called *cratitires*. These do not show themselves till towards the end of September. The *fornites* gradually fall away after the gnats are gone; the *cratitires*, on the contrary, remain on the tree till May, and inclose the eggs deposited by the gnats when they pricked them. In May, the third sort of fruit, called *orni*, begins to be produced by the wild fig-trees. This is much bigger than the other two; and when it grows to a certain size, and its bud begins to open, it is pricked in that part by the gnats of the *cratitires*, which are strong enough to go from one fruit to another to deposit their eggs. It sometimes happens that the gnats of the *cratitires* are slow to come forth in certain parts, while the *orni* in those very parts are disposed to receive them. In this case, the husbandman is obliged to look for the *cratitires* in another part, and fix them at the ends of the branches of those fig-trees whose *orni* are in a fit disposition to be pricked by the gnats. If they miss the opportunity, the *orni* fall, and the gnats of the *cratitires* fly away. None but those that are well acquainted with the culture, know the critical moment of doing this; and in order to know it, their eye is perpetually fixed on the bud of the fig; for that part not only indicates the time that the prickers are to issue forth, but also when the fig is to be successfully pricked: if the bud is too hard and compact, the gnat cannot lay its eggs; and the fig drops when the bud is too open.

"The use of all these three sorts of fruit is to ripen the fruit of the garden fig-tree, in the following manner: during the months of June and July, the peasants take the *orni*, at the time their gnats are ready to break out, and carry them to the garden fig-trees: if they do not nick the moment, the *orni* fall; and the fruit of the domestic fig-tree, not ripening, will in a very little time fall in like manner. The peasants are so well acquainted with these precious moments, that, every morning in making their inspection, they only transfer to their garden fig-trees such *orni* as are well conditioned, otherwise they lose their crop. In this case, however, they have one remedy, though an indifferent one; which is to strew over the garden fig-tree another plant in whose fruit there is also a species of gnats, which answers the purpose in some measure."

The caprification of the ancient Greeks and Romans, described by Theophrastus, Plutarch, Pliny, and other authors of antiquity, corresponds in every circumstance with what is practised at this day in the Archipelago and in Italy. These all agree in declaring, that the wild fig-tree, *caprificus*, never ripened its fruit; but was absolutely necessary for ripening that of the garden or domestic fig, over which the husbandmen suspend its branches. The reason of this success has been supposed to be, that by the punctures of these insects the vessels of the fruit are lacerated, and thereby a greater quantity of nutritious juice derived thither. Perhaps, too, in depositing their eggs, the gnats leave behind them some sort of liquor proper to ferment gently with the milk of the figs, and to make their flesh tender. The figs in Provence, and even at Paris, ripen much sooner for having their buds pricked with a straw dipped in olive-oil. Plums and pears likewise pricked by some insects, ripen much the faster for it; and the flesh round such puncture is better tasted than the rest. It is not to be disputed, that considerable changes happen to the contexture of fruits so pricked, just the same as to parts of animals pierced with any sharp instrument. Others have supposed that these insects penetrated the fruit of the tree to which they were brought, and gave a more free admission to the air, and to the sun. Linnæus explains the operation by supposing that the insects brought the farina from the wild fig, which contained male flowers only, to the domestic fig, which contained the female ones. Hasselquist, from what he saw in Palestine, seemed to doubt of this mode of fructification. M. Bernard, in the memoirs of the Society of Agriculture, opposes it more decidedly. He could never find the insect in the cultivated fig; and, in reality, it appeared to leave the wild fig, after the stamina were mature, and their pollen dissipated: besides, he adds, what they may have brought on their wings must be rubbed away in the little aperture which they would form for themselves. At Malta, where there are seven or eight

varieties of the domestic fig, this operation is only performed on those which ripen latest: the former are of a proper size, fine flavour, and in great abundance, without it; so that he thinks the caprification only hastens the ripening. He examined the parts of fructification of the fig; and he observes, if this examination be made previous to the ripening, that round the eye of the fig, and in the substance of its covering, may be seen triangular dentated leaves, pressed one against another; and under these leaves are the stamina, whose pollen is destined for the impregnation of the grains, which fill the rest of the fruit. These male organs are much more numerous in the wild fig than in the domestic; and the stamina are found to contain a yellow dust, which may be collected when it is ripe. The wild figs, when ripe, are not succulent, and have no taste, though the grains are disposed in the same manner as in the other kind. The pith of the grain of the wild fruit serves as food to a species of the cynips, whose larva is white, till the moment of its transformation; and it is by an opening in the direction of the pistil, that the insect penetrates the grain. From this account it is thought probable that the insect is only communicated by accident to the domestic fig, and that the flowers of this genus are sometimes hermaphrodite. But the number of hermaphrodite flowers being fewer on the cultivated than on the wild fig, the seeds are fecundated more certainly and quickly by the caprification; and every botanist knows, that when the impregnation is completed, the flower soon withers; while, if by any accident it is delayed, it continues in bloom much longer. This view of the subject, therefore, explains very completely the reason why, in Malta, the caprification is practised on the late kind of fig, because it hastens the formation and maturity of the fruit.

CAPRI'FIGUS, (from *capra*, a goat, and *ficus*, a fig; because the food of goats). See CARICA.

CAPRIFO'LIUM, Italian HONEY-SUCKLE, a species of LONICERA.

CAPRIMU'LGA, a large kind of viper, which is not poisonous.

CAPRI'ZANS, a term used by Galen and others to express an inequality in the pulse, when it leaps, and, as it were dances in uncertain strokes and periods.

CA'PSICUM, (καψικον; from καπτω, *to bite;* on account of its effect on the mouth); GUINEA-PEPPER; a genus of the monogynia order, belonging to the pentandria class of plants; and in the natural method ranking under the 28th order, *Luridæ.* The corolla is verticillated, and the fruit a sapless berry.

The species are, 1. The *annuum*, with oblong fruit; the common long-podded capsicum commonly cultivated in the gardens. Of this there is one kind with red, and another with yellow fruit: and of these there are several varieties, differing only in the size and figure of their pods. 2. The *tetragonum*, commonly called *bell-pepper.* The fruit of this is red, and is the only kind proper for pickling, the skin being tender; whereas those of the other sorts are thin and tough. The pods are from an inch to an inch and a half or two inches long; are very large, swelling, and wrinkled, flatted at the top, where they are angular, and sometimes stand erect, at others grow downward. 3. The *cerasiforme*, with a round smooth fruit, does not grow so tall as the other sorts, but spreads near the ground; the leaves come out in clusters, are of a shining green, and stand on long footstalks. The fruit is of a beautiful red, and of the size of a cherry. 4. The *pyramidale*, is a native of Egypt, and has much narrower leaves than the other sorts. The pods always grow erect, and are produced in great plenty, so that the plants make a fine appearance for three months in the winter. 5. The *minimum*, commonly called *bird-pepper*, rises with a shrubby stalk four or five feet high: the leaves are of a lucid green; the fruit grows at the division of the branches, standing erect: these are small, oval, and of a bright red: they are much more sharp and biting than those of the other sorts. Besides these species, botanists describe as many more; viz. the cordiforme, with heart-shaped fruit; the angulosum, with angular heart-shaped fruit; the olivaforme, with oval fruit; the conoide, commonly called *hen-pepper*, with a conical red fruit growing erect; and the frutescens, with small pyramidal fruit growing erect; commonly called *Barbary-pepper.* These, however, have no remarkable properties different from the others.

The first species is that described in the pharmacopœias as a medicine. Dr. Andrew Duncan has found that the pungency of this pepper is soluble in water and in alkohol; not volatile; reddens infusions of turnsole; and is precipitated by infusion of galls, muriate of mercury, nitrate of silver, sulphate of copper, sulphate of zinc, red sulphate of iron (but not blue or green), ammonia, carbonate of potass, alum, but not by sulphuric, nitric, or muriatic, acid, or silicized potass.

What is generally used under the name of *Cayenne pepper* is an indiscriminate mixture of the powder of the dried pods of many species of capsicum, but especially of the *capsicum minimum* or bird pepper, which is the hottest of all.

These peppers have been chiefly used as condiments. See CONDIMENTS. They prevent flatulence from vegetable food, and give warmth to the stomach, possessing all the virtues of the oriental spices, without, as Dr. Wright asserts, producing those complaints of the head which the latter are apt to occasion. An abuse of them, however, gives rise to visceral obstructions, especially of the liver.

In the practice of medicine, there can be little doubt that they furnish us with one of the purest and strongest stimulants which can be introduced into the stomach; while at the same time they have nothing of the narcotic effects of alkohol or opium. Dr. Makitrick Adair, who first introduced them into practice, found them useful, particularly in that morbid disposition which he calls *Cachexia Africana*, and which he considers as a most frequent and fatal predisposition to disease among the slaves. Dr. Wright says, that in dropsical and other complaints, where chalybeates are indicated, a minute portion of powdered capsicum forms an excellent addition, and recommends its use in lethargic affections. This pepper has also been successfully employed in a species of cynanche maligna, which proved very fatal in the West Indies, resisting the use of Peruvian bark, wine, and the other remedies commonly employed. In tropical fevers, coma and delirium are common attendants; and in such cases, cataplasms of capsicum have a speedy and happy effect. They redden the parts, but seldom blister, unless when kept on too long. In ophthalmia from relaxation, the diluted juice of capsicum is found to be a valuable remedy. Dr. Adair gave six or eight grains for a dose, made into pills; or else he prepared a tincture, by digesting half an ounce of the pepper in a pound of alkohol, the dose of which was one or two drachms, diluted with a sufficient quantity of water.

CA'PSICUM A'NNUUM. See Capsicum.

CA'PSULA, (dim. of *capsa*, a chest or case); a term given by anatomists to any membranous production enclosing a part of the body like a bag; as the capsular ligaments, the capsule of the crystalline lens, &c.

CA'PSULÆ ATRABILIA'RIÆ. See Capsulæ renales.

CA'PSULA, in botany, a dry hollow seed-vessel or pericarpium, that cleaves or splits in some determinate manner. See Pericarpium. This species of seed-vessel is frequently fleshy and succulent, like a berry, before it has attained maturity; but, in ripening, becomes dry, and often so elastic as to dart the seeds from their compartments with considerable velocity. This elasticity is remarkably conspicuous in wood-sorrel; balsam, *impatiens; African spiræa, diosma; fraxinella; justicia; ruellia; barleria; lathræa;* and many others. Capsules, in splitting, are divided, externally, into two or more pieces, called by Linnæus *valves*. The internal divisions of the capsules are called *cells, loculamenta:* these, in point of number, are exceedingly diversified; some having only one cell, as the primrose; and others many, as the water-lily. Hence a capsule is termed *unilocular*, *bilocular*, *&c.* according as it has one, two, or more cells or cavities. See Botany.

CA'PSULA GLYSSONI, *vagina Glyssoni*, or *capsula venæ portæ;* a strong tunic, formed of cellular texture, which accompanies the vena portæ, and its most minute ramifications, throughout the whole liver. See Liver.

CA'PSULÆ RENA'LES, glandulæ renales, or *capsulæ atrabiliariæ*; renal capsules or glands. The situation, figure, and size of these are as follow: Immediately above each kidney lies a glandular body, called by the ancients *capsulæ atrabiliariæ;* by others, *capsulæ renales*, *renes succenturiati*, and *glandulæ renales;* and they might be properly enough termed *glandulæ supra renales.* They are situated on the upper extremity of each kidney, a little obliquely, that is, more toward the inner edge and sinus of the kidney, than toward the outer convex edge.

Each gland is an oblong body with three sides, three edges, and two points, like an irregular crescent with its great or convex edge sharp, and the small concave edge broad. Its length is about two thirds of the greatest breadth of the kidney, and the breadth of its middle portion is about one third of its extent between the two extremities, sometimes more, sometimes less. Its colour is a dark yellow.

It has one anterior, one posterior, and one lower side, which last may be termed the *basis;* and it has one upper, and two lower edges, whereof one is anterior, the other posterior. The upper edge may be called the *crista*, and the two lower edges the *labia*. One of its extremities is internal, or turned inward toward the sinus of the kidney, the other is external or turned outward toward the gibbous part of the kidney. The figure of this glandular body may likewise be compared to that of a cock's-comb, or to the top of an helmet.

With regard to their structure, the surface of these glands is uneven; the fore-side is the broadest, and the lower side or basis the narrowest. Along the middle of the anterior side, a ridge runs from the edge of the inner extremity a little above the basis, to the point of the other extremity, and divides this side into two equal parts, like the middle rib of the leaf of a tree; and on the lower side, under the basis, there is a kind of raphe or suture.

The arteries of these glands come from the arteriæ renales and diaphragmaticæ, and likewise from the aorta, from the arteria cæliaca, &c. These vessels are termed the *capsular arteries;* and as they enter the glands, they seem to be invested by a vagina. They are not always derived from the same sources, neither is their number the same in all subjects: and there is commonly a large vein which runs along the ridge. One principal vein returns the blood from each of these glands; the right goes into the vena cava, the left passes into

the renal vein. The nerves on each side are furnished by the neighbouring semilunar ganglion, and by the renal plexus which depends on it.

In the inside of these capsulæ, there is a narrow triangular cavity, the surface of which is full of short, strong villi of a yellowish colour; but in children it is reddish, and of a dark brown in aged people. The sides of this cavity are connected by a greater number of filaments; and they appear to be wholly glandular, that is, to be filled with very fine small folliculous corpuscles. Along the top of the gland these sides touch each other immediately.

In opening this cavity, we find a granulated or follicular substance, which fills it almost entirely; and the blood-vessels are distributed on this substance, as well as on the sides of the cavity. If the section be begun at the great extremity of the capsula, and continued through the upper edge, and if the lateral portions be afterwards separated, the glandular body appears like a kind of crista, raised from the middle of the bottom of the cavity.

This glandular body or nucleus adheres more closely to the bottom or basis of the cavity, than to the two sides, especially near the great extremity; but yet it may be separated both from the basis and sides, being connected to them by a great number of small filaments. It adheres least to the basis near the small extremity.

The capsular vein, which comes ordinarily from the vena renalis, is much larger than the arteries; and it communicates with the inside of the capsula much in the same manner as the vena splenica with the cells of the spleen, for it may be inflated by blowing into part of the capsular cavity, and the air likewise passes into the vena renalis, &c.

The cavity contains an unctous viscid liquor, of a yellowish red colour, which, with age, changes gradually into a yellowish purple, a dark yellow, and a black yellow: sometimes it is perfectly black; but even then, if it be spread thin on a large surface, it appears yellow. It is sometimes found not only reddish, but mixed with real blood.

The uses of these renal glands have not as yet been discovered; and all that we know about the liquor contained in them is, that it has somewhat the appearance of the bile. They are very large in the fœtus, and diminish in adults. These two phænomena deserve our attention.

They lie sometimes directly on the top of the kidneys, but seldom, if ever, on the gibbous part. The gland on the right side is partly connected to the diaphragm, under and very near the adhesion of the great lobe of the liver to that muscle. That on the left side adheres to the diaphragm below the spleen; and both these connections are confined to the contiguous portions of the inferior muscle of the diaphragm. They are involved, together with the kidneys, in the membrana adiposa, of which a very thin portion insinuates itself between the kidneys and glands, and also between them and the diaphragm; so that they adhere to both by the intervention of the cellular substance, which in some subjects contains a stratum of fat.

The venal ridge already mentioned, sinks so deep into the fore-side in some subjects, that the upper part of this side appears to be separated from the lower; but this is seen most distinctly when the capsula is examined in clear water.

When the capsular vein is opened lengthwise with the point of a lancet, we discover in it a great many small holes, many of which are only the orifices of the rami of the vein, others are simple holes; and it is perhaps through these that the air passes into the gland, as already mentioned.

On the outer surface of these capsulæ we observe a very thin, distinct coat, separated from the cellular substance that surrounds them. Sometimes this coat is raised by an uneven stratum of fat, which makes it appear granulated; and, for the same reason, the capsulæ are of a pale colour like a corpus adiposum.

The liquor contained in them appears sometimes, in the fœtus, and in young children, of a blueish colour inclining to red.

To be able to discover the uses of these capsulæ, we must not only attend to the two circumstances already mentioned, but also to their external conformation, which is commonly more regular in the fœtus and in children than in adults and old people. We must likewise consider the consistence and solidity of their substance; which is greater before birth, and in childhood, than in advanced old age; in which they are often very flaccid, and very much decayed; and this perhaps may be the reason why some of the figures given of these glands, taken out of their membrana adiposa, are so very irregular and different from others.

CAPSULAR LIGAMENT, (*capsularis*, from *capsula*, a little bag); also called mucilaginous *ligaments*, as they contain many glands to separate the SYNOVIA. Every articulating bone is furnished with a *capsular ligament*, which ligament is composed of two layers: the external layer is the stronger, being made by the periosteum; the inner is thin and uniform.

The use of the capsular *ligament* is, 1st, to connect the bones. 2dly, to confine the synovia. The *capsular ligaments* are long and large in those bones that are designed for rotation, to give room for motion; and tendons are frequently inserted into them, that by their action they may draw them outward, and prevent their being pinched.

They are generally of an equal thickness all round in the enarthrosis and arthrodia; but in the ginglymus they are thick on the sides, and thin on the fore and hind parts, as in those places their

thickness would have been inconvenient, by hindering the due flexion and extension of the joint; but the tendons strengthen the joint in that part, and partly compensate for the weakness of the *ligament*. In complete luxations, the *capsular ligament* is generally, if not always, ruptured. That of the os femoris is extended, from below the neck of the bone, to admit of a more extensive rotation.

The *capsular ligament* of the head of the humerus proceeds from the edge of the glenoid cavity in the scapula, and is continued over the hemisphere of the head of the os humeri, and is fixed near its edge, towards the muscular surfaces of the great and small tuberosities, and runs down on the neck of the bone, below the lowest part of the cartilaginous hemisphere. In all this course, the capsular is closely fixed in the bone, except a small portion, where it passes over the inner articular tendon of the biceps muscle. The *capsular ligament* always includes the whole joint. Of collections within the *capsular ligaments* of the joints, and the effects of exposure in consequence of penetrating wounds, &c. see the articles JOINT, BURSÆ, &c.

CA'PUT (κεφαλη, Gr.); the head, cranium, or skull. It is situated above the trunk, upon the cervical vertebræ. For its bones, see CRANIUM and BONES. Upon the hairy part are observed the *vertex* or crown, *sinciput* or fore-part, *occiput* or hinder-part, and the *temples*. The parts distinguished on the face are well known; as the forehead, nose, eyes, &c. The arteries of the head are branches of the carotids; and the veins empty themselves into the jugulars.

CA'PUT GALLINA'GINIS, otherwise called *Verumontanum*; a cutaneous eminence in the urethra, lying before the neck of the bladder, somewhat like the head of a cock in miniature. Around this the seminal ducts, and the ducts of the prostrate gland, open. See VESICA.

CA'PUT GA'LLI, small cock's-head French honey-suckle, a species of HEDYSARUM.

CA'PUT MO'RTUUM, in the old chemistry, the dry fœces left in a vessel after the moisture has been distilled from them. They are so called, because they were supposed to be the dead head, or useless origin of the production. As these residues are very different, according to the substances distilled, and the degree of heat employed, they are by the more accurate modern chemists particularly specified by adding a term denoting their qualities; as *earthy residuum*, *charry residuum*, *saline residuum*, &c.

CA'PUT OB'STIPUM, a term for the wry-neck which is mostly a spasmodic affection. See WRY-NECK.

CARACO'SMOS, a name of the sour mare's milk, which is much admired by the Tartars.

CARAGA'NA, a species of ROBINIA.

CARAGUA'TA, the common aloe of Brasil.

CA'RAMBU, a species of *lysimachia* growing in Malabar.

CARANA'IBA, a species of palm or date-tree.

CARA'NNA, or *Gummi Carannæ*; a concrete resinous juice, that exudes from a large tree, of which we have no satisfactory account. It is brought from New Spain and America, in little masses, rolled up in the leaves of flags. Both externally and internally it is of a brownish colour, variegated with irregular white streaks. When fresh it is soft and tenacious, but becomes dry and friable by keeping. Pure caranna has an agreeable aromatic smell, especially when heated, and a bitterish slightly pungent taste. It was formerly employed as an ingredient in vulnerary balsams, strengthening, discutient, and suppurating plasters; but its scarcity has caused it to be forgotten in practice.

CARAWAY. See CARUM.

CA'RBAFUS. Scribonius Largus uses this word for lint.

CA'RBO LI'GNI, the charcoal of wood. In the New Edinburgh Pharmacopœia, a place has been given to this substance, because it is employed by the Edinburgh College in the preparation of the *murias barytæ*; although it does not enter their list of materia medica. As commonly prepared, Dr. A. Duncan says, it is not a pure oxyd of carbon, but contains also a proportion of hydrogen, from which it may be purified by exposure, for some time, to a strong degree of heat. Munch directs it, for medical use, to be reduced to fine powder, and heated in a covered crucible as long as any flame appears on removing the cover, and until it be fully red. It is then allowed to cool in the furnace, the upper layer of the powder is removed, and the remainder sealed accurately up in vials of an ounce each.

At the time that the pneumatic pathology was in fashion, and phthisis and similar diseases were ascribed to hyper-oxygenation of the system, charcoal was strongly recommended as a powerful disoxygenizing remedy, and cases of its successful employment are recorded by Dr. Beddoes and others. From its acknowledged effects in correcting the putridity of animal substances, it is probable that the virtues ascribed to it of preventing the putrid eructations which take place in some kinds of dyspepsia are better founded. Ten grains have therefore been given for a dose with advantage. As an external application, powdered charcoal has been recommended in the cure of inflammation from external causes, gangrene, and all descriptions of fœtid ulcer. The good effects of charcoal, or burnt bread, used as a tooth powder, in correcting the bad smell which the breath sometimes acquires from carious teeth, are undoubted; but for this purpose it should be used in the state of an impalpable powder, otherwise it will act mechanically on the enamel.

In the *Pharmacopœia Chirurgica*, we find the

Cataplasma Carbonis.

"To about half a pound of the common farinaceous cataplasm, two ounces of wood charcoal, in very fine powder, are to be added, and the whole mixed well together."

This remedy is in use at the Worcester Infirmary, where it is found of considerable service in sweetening fœtid ulcers and disposing them to granulate favourably.

It will not be superfluous to notice the power ascribed to charcoal of purifying various fœtid or discoloured fluids. Lowitz found that it destroyed the adventitious colour and smell of vinegar, carbonate of ammonia, tartaric acid, alkohol, supertartrate of potass, and other salts, and that it prevented water from becoming putrid at sea, especially when assisted by a little sulphuric acid. Meat which has acquired a mawkish, or even putrid, smell, is also found to be rendered perfectly sweet by rubbing it with powdered charcoal. These facts have been repeatedly proved by experiment.

CA'RBON, or CARBONE, (from *carbo*, coal); pure CHARCOAL. It is necessary to place this substance among simple bodies, as no experiment has yet satisfactorily shown the possibility of decomposing it.

Carbon, or charcoal, is the black residue of vegetable matters, whose volatile principles have been entirely dissipated by heat. None but organic matters, containing the combustible substance known by the name of oil, afford charcoal. The production of this substance was formerly ascribed to the decomposition of this oily substance; but it is now a fact pretty well known, that the carbonaceous matter exists ready formed in the vegetable, and that what is accomplished by the operation of fire, is merely the separation of the volatile principles that existed in union with it.

Carbon is generally black, brittle, sonorous, and light; and, if well made, has neither smell nor taste. If the vegetable of which it has been formed was very compact, and contained but a small proportion of fluid substance, it still retains a vegetable form. But when the plant decomposed is tender, and contains a good deal of juice, the fluids, as they are disengaged, destroy the organic texture of the vegetable, and leave a friable coal, which does not exhibit the form of a decomposed vegetable. Different vegetable matters afford carbon in greater or less abundance, according to the solidity and the form of their texture. Wood affords much more of this substance than herbs, and gums more than resins, and resins still more than fluid oils. Every different vegetable matter appears to contain this substance in a particular proportion.

When it is required to obtain carbon in a state of great purity, it must be dried by strong ignition in a closed vessel: this precaution is necessary; for the last portions of water adhere with such avidity, that they are decomposed, and afford hydrogenous gas and carbonic acid.

Carbon exists likewise in small quantities in the animal kingdom: it appears in the form of a light spongy mass, difficultly consumed in the air, and mixed with a great quantity of phosphates, and even of soda. It is a body possessed of singular properties, but which are in general very little known, though of the highest importance in chemistry.

Mr. Lowitz, and many other chemists, have observed a remarkable property in this substance, of rendering different saline, mucilaginous, and other bodies, clear and transparent. The physical properties of this substance are, however, different, according to the nature and the state of the vegetables from which it is produced. It is sometimes hard, but at other times friable, and somewhat pulverulent. Pure oils afford a coal in very fine, and seemingly levigated molecules, called lamp-black. The gravity of carbon varies very considerably, and its colour is subject to as many varieties as its other physical properties: it is either of a lighter or a deeper, a sparkling or a dull colour. But the chemical properties of this product of fire, are deserving of much farther examination.

Carbon, when exposed in close vessels to the utmost violence of fire, suffers no alteration. When heated in a pneumato-chemical machine, it affords no hydrogenous gas, unless it happen to contain moisture: an intense heat reduces it to vapour. When heated in contact with air, it burns to ashes; but with singular phenomena, which are to be carefully distinguished from those of other combustible matters. As soon as it takes fire, it becomes red, and exhibits a white flame, which is more considerable in proportion to the mass of carbon. No sort of smoke issues from it; but it is reduced into carbonic acid, an elastic fluid, which, from the experiments of Mr. Lavoisier, appears to be merely a combination of the carbonaceous principle with the oxygenous, in the proportion of three parts of the latter to one of the former. It is on this account that carbon consumes slowly, and leaves nothing but a cinder, more or less white, partly of a saline, and partly of an earthy nature. Different sorts of carbon are of different degrees of inflammability; and this distinction is the most useful to the arts of all the facts respecting it. Some kinds of carbon burn readily with flame, and are quickly consumed; others are difficult to kindle, burn slowly, and remain a long time red-hot, before they are reduced to ashes. Some of them, for instance those of oils, burn indeed with the utmost difficulty. This property they seem to owe

to the obstinate adhesion of the carbonaceous principle to the fixed salts of the vegetables.

This substance, when exposed to the air, attracts moisture; probably because it is very porous; and also on account of its containing salts in a latent state. When moistened, it affords hydrogenous gas, which is produced by the decomposition of the water; for when this fluid is passed through an earthen tube, filled with red-hot carbon, the two bodies are converted into hydrogenous gas and aëriform carbonic acid. Nothing now remains but a little ashes. Mr. Rouelle has observed, that fixed alkali dissolves a pretty considerable quantity of carbon by fusion.

We are next to speak of the *combinations of carbon.*—The sulphuric acid, when exposed to a strong heat with powdered carbon, is decomposed by this combustible body, which has a stronger affinity with oxygen than sulphur has. But the nitric acid is decomposed with much more rapidity by carbon. Dr. Priestley has observed, that there is a good deal of nitrous gas produced from this mixture; and Macquer has found that the nitric acid, by the assistance of a certain degree of heat, produces a very discernible effervescence with this body. Mr. Proust is also said to have succeeded in kindling carbon with acid of nitre, the weight of which was one ounce, four drachms, and twenty-three grains, in a bottle containing an ounce of distilled water. As the result of his experiments is very curious, an account of them may not be improper.

A coal of the extract of *carthamus*, reduced to powder, and newly calcined, detonized in a very lively manner with the nitrous acid; and the combustion was so rapid as to raise the powder in the form of a very beautiful sky-rocket. He calcined likewise very fine powder of common charcoal; and the detonation succeeded very well.

Into a glass retort, perfectly dry, he introduced about a drachm of powder of carbon; after which, he poured into the same retort about as much nitrous acid: the nitrous acid no sooner reached the bottom of the retort, than a detonation was produced with the utmost rapidity. There proceeded out of the mouth of the retort, as he held it in his hand, a stream of flame, more than four inches in length, carrying with it some of the powder, and very dark-coloured vapours of the nitrous acid: the vapours were condensed into a green and somewhat fuming liquor, which proved to be nitrous acid weakened by the water, which entered into the composition of that which detonized first. He poured a new quantity of nitrous acid on the coal, which still remained in the retort, and continued to inflame it in the same way, till the whole quantity was exhausted.

This experiment he repeated with calcined lamp-black, and the same phenomena were exhibited. In the retort, there remained only a very small portion of ashes, sometimes half vitrified, and sticking to the bottom of the retort.

All carbon is usually impregnated with a considerable quantity of moisture. He found that charcoal calcined in the evening was next day unfit for this detonation, having acquired, during the intervening space, a sensible quantity of moisture. But what is very singular, these experiments are so capricious, that they do not always succeed, even with the same carbon and the same acid, intermixed in the very same proportions. By the following expedient, he thinks, success may be secured: when the acid is poured on the middle of the charcoal, it does not take fire at all; but, when the acid is made to trickle down the sides of the crucible or capsule, till it reach the bottom, then detonation infallibly follows, and the powder is raised and kindled by the nitrous acid. When the nitrous acid is all consumed, the detonation ceases of course, and the rest of the carbon remains black.

Carbon combines with oxygen, and forms the carbonic acid; but this combination does not take place unless their action be assisted by heat. See Carbonic acid. Concerning the action of the other acids on carbon we are not well informed.

This substance, by the help of heat, decomposes all sulphuric salts, forming in consequence sulphures with various bases. Carbon causes nitre to detonize; and the nitre burns it by means of the vital air which that saline substance affords by the action of heat. Sulphure of potass dissolves carbon with great facility, both by the dry and the humid way; it even combines with it more readily than any other substance. For this discovery we are indebted to Mr. Rouelle.

Carbon is capable of combining with metals. It combines with iron in its first fusion, and mixes with it likewise in the cementation by which steel is formed. When combined with iron in a small proportion of the metal, it constitutes plumbago. It is likewise capable of combining with tin by cementation; to which metal it gives brilliancy and hardness. Metallic oxyds are also revived when exposed, in contact with this body, to a heat more or less intense. This phenomenon is owing to the near affinity between oxygen and pure carbonaceous matter. The action of vegetable substances on carbon has not been much examined. It is only known, that carbon, mixed with fat oils, renders them susceptible of inflammation by the nitrous acid; a fact which confirms Mr. Rouelle's opinion concerning the inflammation of oils by that acid.

CARBONACEOUS ACID; *acidum carbonicum.* See Carbonic acid.

CARBO'NAS; a carbonate, or neutral salt, formed by the combinations of the carbonic acid, with earths, alkalies, and metallic oxids. Before the brilliant discoveries of Dr. Black, the nature of

these substances was totally unknown. The carbonates were supposed to be simple bodies; and the fact of their acquiring new and caustic properties by the action of fire, was attempted to be explained, by supposing that the particles of the fire combined with them. Dr. Black, however, in the year 1756, demonstrated, by proofs which carried universal conviction along with them, that these bodies, in their caustic state, are simple, and that their mildness is owing to their being combined with carbonic acid.

CARBO'NAS AMMO'NIÆ; the CARBONATE OF AMMONIA. This name has been given to a kind of salt which has generally been known by the title of concrete volatile alkali; and sometimes by that of cretaceous volatile alkali, &c. See AMMONIAC. It may be obtained by distillation from many animal substances. Tobacco affords, likewise, a large proportion; but almost the whole of that which is employed in the arts, and in medicine, is formed by the direct combination of the carbonic acid and ammoniac, or volatile alkali. This combination may be effected by passing the carbonic acid through ammoniac, or the pure volatile alkali in solution; by exposing ammoniac in an atmosphere of carbonic acid gas; and by decomposing the muriate of ammoniac by the neutral salts which contain this acid, such as the carbonate of lime, or common chalk. For this purpose, white chalk is taken, and very accurately dried; and then mixed with equal parts of muriate of ammoniac, or common sal ammoniac, in fine powder. This mixture is put into a retort, and distilled; the ammoniac and the carbonic acid being disengaged from their bases, and reduced into vapours, combine together, and are deposited on the sides of the receiver, where they form a stratum, more or less thick. The form of the crystallization of this carbonate appears, by the experiments of Mr. Chaptal, to be that of a four-sided prism, terminated by a dihedral summit. The carbonate has a less smell than the ammoniac. It is very soluble in water: even cold water dissolves its own weight of this salt, at the temperature of sixty degrees of Fahrenheit. By the accurate experiments of Bergmann, it has been found that one hundred grains of this salt contain forty-five parts of the acid, forty-three of alkali, and twelve of water.

Most of the acids decompose this salt, and displace the carbonic acid from it.

CARBO'NAS BARY'TÆ, the Carbonate of barytes (*baryta*, Edin.). See BARYTES. This is rarely found in nature. Its colour is a greyish-white, sometimes inclining to milk-white, and sometimes with a slight tinge of yellow, from a mixture of iron, seldom greenish, often invested with a red ochry crust. It is found in solid masses, sometimes filling an entire vein, sometimes interspersed with sulphurated barytes, frequently rounded or affecting that form, but seldom crystallized. Although it has no sensible taste, it is poisonous. In medicine it is only used for preparing the muriate of barytes, a medicine given in scrofulous affections.

According to different analyses, the constituent parts of this substance are as follow:

	Acid.		*Barytes.*		*Water*
By Withering,	20	+	80		
Pelletier,	22	+	62	+	16
Kirwan,	22	+	78		
Fourcroy,	10	+	90		

CARBO'NAS CA'LCIS, carbonated lime, the most common of all minerals. It is found under a great variety of forms, and has various names, as chalk, limestone, marble, spar, &c. In form it is either amorphous, stalactical, or crystallized. When amorphous, its texture is either foliated, striated, granular, or earthy. The primitive form of its crystals is a rhomboidal parallelopiped. Its hardness, lustre, and transparency, are various. When it is transparent, it causes a double refraction. Its specific gravity is from 2.315 to 2.78; its colour, when pure, white. It effervesces violently with muriatic acid, and dissolves entirely or nearly so in that menstruum, forming a colourless solution. Its different varieties may be arranged under, 1. Soft carbonate of lime, or *Chalk*. 2. Indurated carbonate of lime, or *Marble*. These contain about forty-five parts of carbonic acid, and fifty-five of lime.

In medicine prepared chalk is given to correct acidity in the primæ viæ, especially when accompanied with diarrhœa. When powdered, chalk has been externally applied with success to scalds and burns. See BURNS. It is employed in the preparation of carbonic acid gas, and of the muriate of lime.

CARBO'NAS POTA'SSÆ, the CARBONATE OF POTASS. What is thus called in the new chemistry, is a neutral salt resulting from a saturated combination of carbonic acid with potass. It was formerly distinguished by several different names, as *cretaceous tartar*, *mephitic tartar*, &c. and was always taken for a pure alkali, until the experiments of Doctor Black showed it to be a neutral salt. The old name by which it was known was that of *fixed salt of tartar*, from its being obtained by the incineration of tartar of wine; and it was considered as an alkali, on account of its possessing some of the properties of those salts. The method of causing oil of tartar to crystallize, has been known for a considerable length of time; and both Bonhius and Montet have successively shown the manner of conducting these processes: the most simple method, however, consists in exposing an alkaline solution in an atmosphere of the carbonic

acid gas which is disengaged in the vinous fermentation; in this way the alkali becomes saturated, and forms tetrahedral prismatic crystals terminated by very short four-sided pyramids. Mr. Chaptal has frequently obtained those crystals in the form of quadrangular prisms, with their extremities cut off slantwise. This neutral salt no longer possesses the urinous taste of the alkali, but exhibits the penetrating taste of neutral salts, and may be employed in medicine with the greatest success and convenience, as it possesses an advantage beyond the salt of tartar, in being less caustic, and always of the same virtue. According to the analysis of Bergmann, carbonate of potass, when saturated with the acid, and regularly crystallized, to which he gives the name of *aërated vegetable alkali*, contains twenty parts of the acid, forty-eight of pure alkali, and thirty-two of water in the quintal. But it must be observed, that carbonates are more liable than other neutral salts to vary in the quantity of the acid. This salt, when perfectly crystallized, does not attract the humidity of the air, as it may be preserved for several years in an open vessel, without any appearance of alteration.

The carbonate of potass is decomposed by silex in a sufficient degree of heat, which occasions a considerable boiling or ebullition. The residue is glass, in which the alkali is in the caustic state. Lime likewise decomposes it, having a greater affinity than potass with the acid. Lime-water poured into a solution of carbonate of potass, gives a precipitate of an almost insoluble salt, produced by the combination of lime with the carbonic acid; and the pure or caustic alkali remains dissolved in the water. In pharmacy, this process is made use of for the preparation of the *lapis causticus*, which is nothing but fixed vegetable alkali rendered caustic by lime. Thus lime decomposes the carbonate by uniting with the acid, and acids produce the same effect by seizing and combining with the alkaline bases.

CARBO'NAS SODÆ, the CARBONATE OF SODA. This salt, like the carbonate of potass, was formerly thought an alkali. It is, however, a combination of the carbonic acid with the mineral alkali; and seems to be the salt which the ancients called *natron*. Generally, however, it has been called *salt of soda* (see BARILLA), because it can be obtained pure, and regularly crystallized by evaporating a lixivium of common soda. It has also had other denominations, as *aërated mineral alkali*, *cretaceous soda*, &c. The mineral alkali, in its natural state, contains a greater quantity of the carbonic acid than the vegetable; and nothing more is necessary than to dissolve it, and duly evaporate the water, in order to obtain it in crystals. These crystals are usually rhomboidal octahedrons; and sometimes have the form of rhomboidal laminæ, being applied obliquely one upon the other, in a manner resembling tiles. When this salt is exposed to the air, it crumbles down very readily into dust; as the air deprives it of the water of its crystallization: but it is not altered by this efflorescence; as we can restore to it its primary form by solution in water.

By an exact analysis, Bergmann has found, that one hundred parts of carbonate of soda, which he denominates *ærated mineral alkali*, contain sixteen parts of the acid, twenty of pure alkali, and sixty-four of water. The affinity of its basis with silex is stronger than that of the carbonate of potass; in consequence of which, the vitrification it produces is more quick, easy, and perfect.

Lime, barytes, and the acids, decompose this salt with the same phenomena that have been observed in treating of the *carbonate of potass*.

Dr. A. Duncan observes, that the carbonates of soda commonly imported, are inferior in purity to those obtained by decomposing the sulphate of soda. That commonly used, is obtained by the bleachers as a residuum in their method of preparing oxygenated muriatic acid, by decomposing muriate of soda with sulphuric acid and the black oxyd of manganese.

1. The sulphate of soda is decomposed by *carbonate of potass*. Mr. Accum has described the manipulations of this mode. A boiling concentrated solution of about 560 pounds of American potass is ladled into a boiling solution of 500 pounds of sulphate of soda, agitated together, and the whole quickly heated to ebullition. It is then drawn off into leaden cisterns, lined with thick sheet-lead, and allowed to cool in a temperature which should not exceed 55°.

The fluid is then drawn off, and the mass of salt washed with cold water, to free it from impurities, and again put into the boiler with clean water. This second solution is also evaporated at a low heat, as long as any pellicles of sulphate of potass form on its surface, and fall to the bottom of the fluid. The fire is then withdrawn, and the fluid ladled out into the cistern to crystallize. Unless the fluid be allowed to cool pretty low before it is removed to crystallize, the salt obtained will contain sulphate of potass.

2. By *acetate of lime*. The acetous acid for this purpose is obtained by distillation from wood, during its conversion into charcoal.

3. By *litharge* or sub-acetate of lead. Very pure carbonate of soda is prepared by this process in London, and in the vicinity of Edinburgh.

4. By *decomposing the sulphuric acid by charcoal*. About 500 cwt. of sulphate of soda, and 100 cwt. of charcoal are ground together, and the mixture exposed in a reverberatory furnace until it becomes pasty. It is then transferred into large casks, and lixiviated; and the ley is afterwards evaporated and crystallized. By this or a similar process, very

pure carbonate of soda is manufactured in the west of Scotland. On the Continent, muriate of soda is sometimes decomposed by potass, and sometimes also by lime.

In medicine, this substance may justly be supposed to possess similar virtues with the carbonate of potass: indeed from its crystallizability and efflorescence when exposed to the air it is preferable to it, because its dose may be more accurately ascertained; and it may be given either in the form of a powder, or made up into pills.

CARBONATES; salts formed by the union of carbonic acid with different alkaline, earthy, and metallic bases; there are twenty-four species enumerated in M. Fourcroy's Elements of Natural History and Chemistry. See CARBONAS.

CARBONIC ACID, otherwise called *Carbonic acid gas*, *Cretaceous acid*, *Fixed air*, *Mephitic gas*, or *Aërial acid.* The name of *Carbonic Acid* has been given to an acid which occurs in great abundance through the whole of nature, and which appears almost always in the state of an aëriform fluid. This acid seems to have been in some degree known to the ancient chemists. Van Helmont gave it the name of *gas silvestre*. Dr. Black of Edinburgh must, however, be considered as the real discoverer of this acid; he maintained, in the year 1755, that lime-stone contained much air of a different nature from that of common air, and affirmed that the disengagement of this air converted it into lime, and that calcareous stone was regenerated by the restoration of this air. The same doctrine was supported by additional facts in 1746, by Dr. M'Bride; and Mr. Jacquin, a professor at Vienna, resumed the same pursuit, and multiplied experiments on the same manner of extracting it, and adduced some other proofs in confirmation of the opinion that the absence of this air rendered alkalis caustic, and formed lime; and the industry and extensive experimental knowledge of Dr. Priestley threw still greater light upon this subject. At that time, this substance was known by the name of *Fixed Air*. Bergmann, in the year 1772, proved it to be an acid to which he gave the name of *Aërial Acid;* and since that time it has been distinguished by the names of *Mephitic Acid*, *Cretaceous Acid*, &c. But as soon as it was discovered to consist of a combination of oxygen and carbon, or pure charcoal, the name of carbonic acid, was affixed to it. This acid is found in three different states: in a state of gas, of mixture, and of combination.

It is met with in a state of gas in the famous Grotto del Cani, near Naples, and in various other subterraneous places, such as tombs, cellars, necessaries, &c. It is also disengaged in this form by the decomposition of vegetables heaped together, by the fermentation of wine or beer, by the putrefaction of animal matters, &c. This substance exists in the state of simple mixture in mineral waters, and in these it possesses all its acid properties and virtues. See ACIDULOUS WATERS and MINERAL WATERS. The carbonic acid is contained in a state of combination in lime-stone, common magnesia, alkalis, and such like substances.

The Abbé Nollet, who had the courage to respire the vapour, perceived a suffocating sensation, and a slight degree of acidity, which produced coughing and sneezing. Pilatre de Rozier caused himself to be fastened, by cords fixed under his arms, and descended into the gaseous atmosphere of a back of beer in fermentation. He had scarcely entered into the mephitis before slight prickings obliged him to shut his eyes; a violent suffocation preventing him from respiring: he felt a giddiness, accompanied with those noises which characterize apoplexy; and when he was drawn up, his sight remained dim for several minutes. The blood had distended the jugulars; his countenance had become purple; and he neither heard nor spoke, but with great difficulty: all these symptoms, however, disappeared by degrees.

In collecting this acid, different processes are employed, according to the state in which it is met with. When it exists in the state of gas, it may be collected by filling a bottle with water, and emptying it into an atmosphere of this gas: the acid in this case takes the place of the water, and the bottle is afterwards corked to retain it. It may also be procured by exposing lime-water, caustic alkali, or even pure water, in its atmosphere; in which case the gaseous acid mixes or combines with these substances, and can be afterwards extracted by re-agents.

This acid, when it is found in a state of combination, may be extracted either by distillation with a strong heat, or by the re-action of other acids, such as the sulphuric acid, which has the advantage of not being volatile, and consequently is not altered by its mixture with the carbonic, which is disengaged.

When this acid is met with in the state of simple mixture, as in water, brisk wines, &c. it may be obtained by agitation of the liquid which contains it; and by making use of a bottle to which a moistened bladder has been fitted; and also by distillation. These methods are not, however, very accurate.

Another method has been attempted by Dr. Gioanetti, which consists in precipitating the acid by means of lime water, weighing the precipitate, and deducting thirteen thirty-second parts for the proportion of carbonic acid: it having been deduced from analysis by this physician, that thirty-two parts of carbonate of lime contain seventeen of lime, two of water, and thirteen of acid.

That this substance is an acid, seems pretty evident from the tincture of turnsole becoming red when agitated in a bottle filled with this gas. In the second place, ammoniac or volatile alkali, when

poured into a vessel filled with this gas, becomes neutralized. Water impregnated with this gas has also a strong sub-acid taste, and it neutralizes alkalis, and causes them to crystallize. Although this acid, in the state of an elastic fluid, may seem to possess all the appearances of air, it has very different physical properties. It is improper for the purposes of respiration, as has been shown by the foregoing, and many other experiments. Indeed, it is this gas which produces so many unhappy accidents at the opening of cellars, and in places where wine, cyder, or beer, are suffered to ferment.

Nevertheless, as it has been found that this gas may be dissolved in water with great facility, when the latter is sufficiently impregnated with it, this preparation has been found to possess highly valuable medicinal qualities; and, with a view to its application in this way, various apparatus have been invented at different times, but Dr. Nooth's glass machine is unquestionably the most convenient.

The carbonic acid has been said to cure cancer (see CANCER): how little this is to be depended upon is, however, pretty well determined. In this kingdom and in France it has had a very extensive trial. After the first application, the cancerous ulcer exhibits a more favourable appearance; the sanies becomes white, consistent, and laudable; the flesh assumes a lively colour: but these flattering appearances do not continue; the ulcer soon returns to its former state, and passes through the usual changes with unabated violence.

This acid gas is found to be heavier than common air. The proportion between these two airs in weight, according to Mr. Kirwan, is as 45.69 to 68.74; but, according to the experiments of Mr. Lavoisier, as 48.81 to 69.50. The great weight of this gas causes it to occupy the lowest situations; and even gives it the property of being poured out from one vessel to another, so as to displace the atmospheric air.

It seems now to be proved, by a sufficient number of experiments, that the carbonic acid is a combination of carbon, or pure charcoal, and oxygen. Thus the oxyds of mercury, when distilled, are reducible without addition, and afford only oxygenous gas; but, if a small quantity of charcoal be mixed with the oxyd, the product which comes over consists of carbonic gas only, and the weight of the charcoal is diminished. If well-made charcoal be ignited, and plunged into a vessel filled with oxygenous gas, and the vessel be instantly closed, the charcoal burns rapidly, and at last goes out: the product in this experiment is carbonic acid, which may be separated by the known processes: the remainder is a small quantity of oxygenous gas, which may be converted into carbonic acid by the same treatment.

It has been found, that the proportion of charcoal to that of oxygen is as 12.0288 to 56.687. In some cases, where the carbonic acid is obtained by burning hydrogenous gas, it arises from carbon being held in solution in this gas. The carbon may even be dissolved in hydrogenous gas, by exposing it to the focus of the burning mirror in the mercurial apparatus, under a glass vessel filled with this gas. The hydrogenous gas which is extracted from a mixture of sulphuric acid and iron, holds more or less of charcoal in solution; as iron itself contains this substance in a greater or less quantity, as has been well ascertained by the experiments of Mr. Berthollet, Monge, and Vander Monde. The alkalis, such as we usually meet with them, also contain carbonic acid; and it is this acid which modifies them, and diminishes their energy, at the same time that it communicates to them the property of effervescing. Alkalis may therefore be considered as carbonates with an excess of alkali; and it is easy to saturate this superabundant alkali, and to form crystallizable neutral salts.

CARBUNCLE, (*carbunculus;* dim. of *carbo*, a coal); a kind of boil which soon becomes gangrenous. For an account of this, as it appears in common cases, see ANTHRAX. A tumor of a pestilential nature, to which the name of *carbuncle* has been given, remains to be described here.

Pestilential carbuncles have been divided, by different authors into several varieties: one writer makes three, another four, and a third five, different kinds. Dr. Russell, however, divides the carbuncles he met with in Egypt into five varieties.

1. The first appeared in the form of a small pustule, about the size of half a pea, on its upper surface of a dusky or yellow colour, and a little wrinkled. The skin which immediately surrounded this pustule was hard and inflamed. The pustule itself soon became very painful, and continued to increase till it became a tumor of the size of a nutmeg, and sometimes that of a walnut, and a yellowish matter was secreted under the cuticle, which was sometimes moist, at other times dry and crusty; the rest of the tumor assumed a dark reddish colour, the circle which surrounded it appearing at different times of various hues. On the third, fourth, or fifth day of the carbuncle, a gangrenous crust appeared on the middle of it, which soon occupied the whole surface of the tumor, exactly resembling the black eschar formed by a caustic. This crust, when the termination was favourable, was thrown off by suppuration, leaving an ulcer of various depth, which for some time continued to discharge matter. When the case terminated fatally, the crust remained dry, and often spread to the inflamed circle surrounding the carbuncle, so as to form a gangrene of considerable extent.

2. The second kind of carbuncle appeared in the form of a small angry pustule, not rising so high as the former; more disposed to spread, and becoming gangrenous on the second day. In this

state, it was not easily distinguished from the other, but was generally surrounded with a more highly inflamed ring. It chiefly attacked tendinous parts, particularly the joints of the fingers and toes.

3. In the third variety, the cuticle was at once raised into a blister of the size of a horse-bean, filled with a dusky yellow or blackish fluid; and the skin which surrounded this variety of the carbuncle was less tense, and of a paler red than that surrounding either of the foregoing. When the blister broke, the cuticle fell upon the flat surface, which was of a dark colour, and soon became black. At this period, that is, about the third or fourth day of the carbuncle, it resembled the preceding varieties, except that it was flatter. The circle surrounding the eschar gradually assumed a very dark red, but never became gangrenous. The eschar was about the size of a six-pence. This carbuncle was very painful, and five or six sometimes appeared on the same patient.

4. The fourth variety was a small red spot raised only to the touch, which gradually rose higher, and spread till, in twenty-four hours, it was a flattish dusky pustule, surrounded by a light rose-coloured margin. This carbuncle was very painful, and, when it appeared on the face, occasioned swelling, but without inflammation of the skin. It often became black beyond the rose-coloured margin on the second day, and the mortification spread to the neighbouring parts. This species of carbuncle always accompanied other eruptions, and cases of it were usually pretty numerous.

5. The fifth and last variety appeared at first a pustule, which, on the second day, resembled that of the small-pox; it rose, in the form of a cone, to twice the size of a large distinct pock, with a blunt yellowish point, which, instead of advancing to suppuration, became black to the size of a large field pea. The gangrene in this case, however, did not spread farther. The margin became of a dusky red, but appeared brighter as the suppuration which threw off the eschar advanced. After the second day, this differed from the third and fourth varieties, only in the gangrenous part being of less extent, and the pustule more raised.

"There are certain eruptions," says Dr. Wilson, "which now and then appear in the plague, in some respects differing considerably from any of the carbuncles just described; in others resembling them. Such is the eruption which has been termed papulæ ardentes, or fire-bladders. But it would be tedious to enumerate all the various eruptions of this kind which have been observed in different epidemics. The true pestilential carbuncle may be defined, a pustular or vesicular eruption, sooner or later running to gangrene. The disease called *anthrax*, is nothing more than a carbuncle after it has become sphacelated.

"Carbuncles, to whatever variety they belong, for the most part do not exceed the size of a walnut; they have sometimes been observed considerably larger. The time of appearance is uncertain; they sometimes show themselves on the first day of the complaint, but more commonly not till a later period; and, when several appear on the same person, they generally succeed each other rapidly. They have been known to come out as late as the eighteenth or twentieth day."

With regard to the number which may appear on the same patient, Dr. Russell observes, that, of the first and second species, seldom more than one or two were observed in the same subject; in general one only. The other varieties occurred in greater number, and, including those of the fifth, he says, he sometimes counted between twenty and thirty, but this happened very rarely.

The carbuncular eruption is always attended with considerable pain; but, in some cases, it is very violent. No external part of the body is exempted from carbuncles. Dr. Russell observed them to take place in almost every part, the penis and scrotum not excepted; but he never observed them on the tongue, the tonsils, and internal parts of the mouth. There have been instances, however, Dr. Wilson says, of their appearing on the tongue; though, in carbuncles on the cheek, near the corner of the mouth, the gangrene spreads inwards, and, in one instance of a carbuncle on the eyebrow, the gangrene spread itself upon the globe of the eye, and destroyed a part of it.

The carbuncle is a less favourable eruption than the bubo, (see Bubo, Pestilential). Carbuncles were regarded by the Russian physicians, Dr. Guthrie informs us, as a sign of greater malignity than buboes. They thought the carbuncle indicated less danger when red than when livid; when it suppurated than when it did not. When the hands and feet were the seat of carbuncles, Dr. Guthrie informs us, the patient seldom or never recovered. Carbuncles on the spine were also regarded as particularly unfavourable. See Pestis.

CARBURE OF IRON; the name given to PLUMBAGO in M. Fourcroy's Elements of Natural History and Chemistry.

CARCINO'DES; the name of a tumor resembling a cancer.

CA'RCINO'MA, (*καρκινωμα*; from *καρκινος*, *a cancer*, and *μενω*, *to feed upon)*; a cancer. See Cancer.

CA'RCINOS, (*καρκινος*); a cancer. See Carcinoma.

CARDAMI'NE, (*καρδαμινη*; from *καρδια*, *the heart;* because it acts as a cordial and strengthener, or from its having the taste of eardamum, that is, nasturtium or cress); common LADY'S SMOCK, or *cuckoo-flower*. It is the *cardamine pratensis* Linn. *Cardamine foliis pinnatis, foliolis radicalibus subrotundis, caulinis lanceolatis.* Class, *Tetradynamia.*

Order, *Siliquosa.* This plant, which is a native of England, has a place in the materia medica, upon the authority of Sir George Baker, who has published five cases, two of chorea Sancti Viti, one of spasmodic asthma, an hemiplegia, and a case of spasmodic affections of the lower limbs, wherein the *flores cardamines* were supposed to have been successfully administered.

Cardamine grows about a foot high; its lower leaves are pinnated; each leaf consists of four or five pairs of small, roundish pinnæ, not always set directly opposite, having one single; that at the end larger than the rest. The stalk is smooth and round, bearing leaves which are less, and having narrower pinnæ. The flowers grow several together at the top, each consisting of four roundish leaves, of a white colour, or, in some plants, having a dash of purple, with darker veins running through them. The seeds are small and reddish, growing in long slender pods. The root is small and fibrous. It grows in meadows, and flowers in April.

In the London Medical Transactions, vol. i. p. 442, &c. Sir George Baker relates the case of spasmodic asthma. This, he says, had resisted all other means, and was cured at last by taking the flowers of this plant. The patient took at first ℈j. twice a-day, by which he found relief. He had afterwards ʒſs. twice a-day; by continuing which, the cure was perfected. The chorea Sancti Viti was cured by ʒſs. twice a-day. The case was obstinate while other means were used, but soon gave way to these flowers. To these the author adds a case, in which palsy, a difficulty of swallowing, and convulsions, were complicated; and, though these disorders had been of long standing, relief was obtained by ʒſs. of these flowers taken twice a-day. He further observes, that in doses of ʒj. this remedy has succeeded as an antispasmodic, where opium, camphor, and valerian failed; that they have been given to the extent of ʒſs. three times a-day; and that they improve the appetite.

Dr. Greeding, though he tried this medicine in large doses in a great number of cases, experienced its good effect only in one. Dr. Cullen mentions this plant, and particularly its flowers, to be far inferior to several others of the siliquosæ in the sensible qualities; so much so, that he should not have thought of taking notice of them, as subjects of the materia medica, but on the authority of Sir Geo. Baker, referring to his paper on this subject, as quoted above.

Linnæus observes, that these flowers are pungent to the taste. Dioscorides says, they are warm and diuretic; Galen, that they resemble water-cresses in taste and virtues; Dale, that they are antispasmodic; and Dr. T. Robinson, that they are powerfully anti-epileptic. There is no doubt, however, but they merit the attention of practitioners.

CARDAMI'NE PRATE'NSIS; the systematic name for the plant called cardamine in the pharmacopœias. See CARDAMINE.

CARDAMOM. See CARDAMOMUM.

CARDAMO'MUM MA'JUS; the greater cardamom. A large, brown, somewhat triangular husk, the thickness of one's thumb, and of a pyramidal shape. The seeds resemble the grana paradisi: their virtues are similar to those of the cardamomum minus.

CARDAMO'MUM ME'DIUM. The seeds of this species correspond in every respect with the lesser, except in size, they being twice as long, but no thicker than the cardamomum minus.

CARDAMO'MUM MI'NUS, (καρδαμωμον; from καρδαμον, and αμωμον, because it partakes of the nature, and is like both the cardamum and amomum); the officinal cardamom. It is the *amomum repens*, or *le cardamome de la côte de Malabar*, of Sonnerat. Class, *Monandria.* Order, *Monogynia.* The seeds of this plant are imported in their capsules or husks, by which they are preserved, for they soon lose a part of their flavour when freed from this covering. On being chewed, they impart a glowing aromatic warmth, and grateful pungency; they are supposed gently to stimulate the stomach, and prove cordial, carminative, and antispasmodic, but without that irritation and heat which many of the other spicy aromatics produce. Simple and compound spirituous tinctures are prepared from them, and they are ordered as a spicy ingredient in some other of the officinal compositions; but the propriety of employing them in *powders* may be doubted for the reason assigned above.

CARDI'ACA, the herb called MOTHERWORT. It is also called *agripalma gallis*, *marrubium*, and *cardiaca crispa*, Ruellii. It is the *Leonurus cardiaca;* Class, *Didynamia.* Order, *Gymnospermia.* Linn. Gen. Plant. 722. It is called cardiaca, because it is cordial in its effects, and relieves disorders of the stomach. It is a large plant, with square branched stalks, the leaves set in pairs on long pedicles at the joints, and the flowers in clusters round the upper joints. The leaf is dark-coloured, cut deep into three sharp-pointed, indented segments, of which the middle one is the longest, and the two lateral ones commonly again deeply cut. The flower is purplish, labiated, with the upper lip long and arched, the lower short, and cut into three sections. It is biennial, grows wild in waste grounds, and flowers in July in this country.

CARDI'ACA, (from καρδια, *the heart and upper orifice of the stomach;* because they not only act by the immediate application of stimulus to the heart, but also produce sympathetic effects on that

organ by their application to the stomach). In pharmacy, a cardiac signifies an aromatic medicine, which warms the stomach and quickens the pulse. This is the effect of all cordial remedies. However, it is only temporary; since, far from communicating permanent strength and vigour to the animal system, their secondary effects are directly subversive of that principle, and they produce *indirect debility* by long continuance, in the same manner as ardent spirits destroy the powers of the human stomach. See STIMULANTS.

CARDI'ACA, CONFE'CTIO; the old name for the AROMATIC ELECTUARY. See that article.

CARDI'ACA ARTE'RIA; the same as coronaria cordis arteria.

The cardiac or coronary arteries of the heart, arise from the aorta immediately on its leaving the heart. They are two in number; and, according to the natural situation of the heart, one is rather superior than anterior, the other rather inferior than posterior.

They go out near the two sides of the pulmonary artery; which having first surrounded, they afterwards run upon the basis of the heart in form of a kind of crown or garland, from whence they are called *coronariæ.* They first run between the auricles, and then pursue the superficial traces of the union of the two ventricles, from the basis of the heart to the apex.

They send communicating branches to each other, which are afterwards lost in the substance of the heart. The right artery, after running between the auricle and ventricle of that side, sends branches to the pulmonary artery, to the fat surrounding it, and to the beginning of the aorta: then it gives three branches to the convex side of the heart, and as many to the flat surface. The left artery runs between the pulmonary artery and left auricle, and afterwards divides into branches, one of which is anterior, and runs down, sending off branches that reach the point of the heart: some of these are reflected upon the flat surface so as to communicate with the branches of the right trunk. Another branch runs between the left auricle and ventricle, to the obtuse side of the heart, and then to its flat surface, where it is lost in the substance of the left ventricle; but sends branches to the left auricle and pulmonary veins; and here it communicates with branches of the trunk on the right side.

Anatomists meet with a third coronary artery, which arises from the aorta more backward, and is spent on the posterior or lower side of the heart.

CARDI'ACA PA'SSIO; the cardiac passion. Ancient writers frequently mention a disorder under this name; but the moderns always speak of it as a *syncope.*

CARDI'ACUS MO'RBUS; a name by which the ancients called the typhous fever.

CARDIA'LGIA, (*καρδιαλγια*; from *καρδια, the cardia*, and *αλγεω, to be pained)*; the heart-burn. This complaint is known by an uneasy sensation in the stomach, anxiety, heat, which extends sometimes up the œsophagus, oppression, fainting, inclination to vomit, a discharge of clear lymph from the stomach. The mind also seems disturbed; there is a difficulty of breathing, loss of strength, coldness of the extremities, frequent eructations, which, while discharging, alleviate the pain; head-ach, vertigo, trembling, a weak pulse that is intermitting and unequal; the face is pale, yellow, or livid, &c. A greater or smaller number of these symptoms are the attendants of the cardialgia, which approaches generally with yawning and listlessness, and at its height the extremities are cold. It does not quit the patient till heat returns into the feet, and it often totally vanishes with a copious perspiration.

The cardialgia must be distinguished from that oppression and uneasiness in the stomach, which is only the effect of overcharging it with food, the colic, and deliquium. Dr. Cullen ranks it as synonymous with DYSPEPSIA; and considers it arising either idiopathically, or symptomatically, in two ways; first, from a disease of the stomach itself; secondly, from an affection of some other part, or of the whole habit. We have, for this reason, noticed cardialgia under the foregoing head; and also under PYROSIS, or water-brash. We are assured, however, that the latter has only a few of the symptoms in common with cardialgia, neither are we satisfied with the decision of Dr. Cullen, in this respect; for which reason we give the disease a distinct consideration.

The causes are various, as flatus, acid and other acrimonious humours in the stomach, a deficiency of its mucus, pungent aliment, worms, a transition of rheumatism or gout to the stomach, or an ulcer in any part of it; fat aliment, especially if cold small liquors are drank too soon after eating it; bilious matter, which is known by bitter and nauseous eructations, as well as by a yellow or greenish discharge by vomiting; congestions of blood about the region of the stomach, from a plethora, or from spasms. Dr. Hunter thought this disorder rather caused by fumes arising from acrid humours, than from the humours themselves: the reason assigned is, because, if the patient puts himself into a posture to prevent the fumes arising to the part affected, immediate relief is generally found. A spasm in the orifices of the stomach, by which the vapours are impeded in their passage from this viscus, and by the heat of the part rarefying the air, produces a distension, anxiety, &c. particularly after meals. Corrosive poisons, stones in the gall-ducts, or in the ureters, produce this disease in the stomach by sympathy.

If this disorder succeeds a fever, with petechial or purple spots, it is generally a fatal sign: following a cessation of pain in gouty limbs, manifests a translation of the disorder inwards; or, if it succeeds foul exulceration of the skin, there is much danger. Coming on upon a sudden check of dysentery, it is a bad sign; but, except it is attended with inflammation, or is the consequence of some other disease, it is rarely dangerous.

It should be considered, in treating this disease, whether it is merely *symptomatic*. If it is, regard must chiefly be had to the primary disorder; but, if it be an *original* complaint, its various causes must be adverted to, that the remedies may be adapted to the particular one in question.

The diet should be light, generally of the animal kind: what is drank should not be apt to ferment; brandy and water, or water in which toasted bread is steeped, will generally agree; or camomile tea, which sooths the spasmodic motions of the stomach. Lime-water, the mineral alkaline and acidulous waters, are proper for common drink.

If acid juices in the primæ viæ are the cause, absorbent earths, or rather mild alkaline solutions, will be the remedies; and of these the mixtura cretacea, magnesia alba with small doses of the natron, are elegant and efficacious. If with acidity the digestion is weak, besides the magnesia at proper intervals, bitter infusions mixed with mild aromatics will be proper, and chalybeates, particularly the rubigo ferri, or tinctura ferri muriati. Acrimony of any kind is relieved for the present by cold water, in which gum-arabic is dissolved. If the acrimony cannot be got the better of by dilution, we must endeavour to evacuate it by vomiting the patient with camomile tea, or ipecacuanha. When *worms* produce it, avoid all the acrid anthelmintics; give warm milk, mint, penny-royal, or any other simple distilled waters. In *hysteric* or *hypochondriac cardialgias*, light infusions of the bark, with rhubarb, and small doses of fixed alkaline salt; the chalybeate waters, and exercise on horseback, should also, if possible, be used. In hypochondriac cases, nitre is often useful.

When a *vomiting* attends a *bilious cardialgia*, avoid hot carminatives, but supply the patient with sp. ætheris vitriolicus compositus, in due doses, and as frequently as the urgency of the symptoms requires.

In general, in any of the cases of alkaline acrimony, after an emetic, a gentle cathartic, or both; acids, such as the sp. æth. nitrosi, acid. vitriol. dilutum, sp. ætheris vitriolici composit. diluted with water, or other small liquors, are indicated. If produced by salt aliments, warm water should be drank, and after it a little of any spirituous liquor. If aromatics or high-seasoned food be the cause, frequent draughts of warm water give the speediest and most effectual relief. When an undue use of spirituous liquors creates this disorder, the bark and vitriolic acids before and after meals, moderate exercise, and the mineral alkaline waters, are the best means of recovery. When flatulence, with a weak stomach, are the chief causes, carminatives, such as flor. cham. vel cort. aurant. ʒfs. ad ʒj. gives much relief; but mild opiates are often to be preferred.

Violent vomits, drastic purges, and caustic poisons, produce this disorder. Whenever these are its cause, give plenty of warm water, to promote two or three discharges upwards, then milk and water and oily mixtures, with small doses of some warm opiate. Gouty matter in the stomach, causing this complaint, is to be removed by æther and brandy, or other warm cordials, taken in moderate quantities, until the stomach itself becomes warm; how much will do, the feelings of the patient alone can determine.

Medical men have differed as to the immediate seat of this disease; some acquiescing in the general opinion, and others contending that the stomach is affected at its lower orifice. The question is scarcely worth deciding, since the remedies are the same in either case. The following case shows, that an irritation of the *pylorus* from mechanical obstruction, will produce this affection. It is entitled, "An Account of a Case of Scirrhous Pylorus," communicated in a letter from Dr. Harrison, of Philadelphia, to Dr. Nath. Hulme; and was read April 18th, 1796, to the Medical Society of London.

"Mrs. Bowyer, of Philadelphia, aged 57, had been afflicted above a year with cardialgia, flatulencies, a slow fever, and frequent vomitings. She was not thirsty, her body was open, pulse slow but regular, her tongue somewhat white, and towards morning dry.

"Sept. 29, 1795," says Dr. Harrison, "I directed her to take at bed-time four grains of James's powder, which, producing no sensible effect, was afterwards increased to six grains, and continued regularly until the 8th of October, but without any advantage to her. As she laboured under great debility, I then directed a tonic medicine, consisting of vitriolated iron, myrrh, and tincture of bark; and, as she generally brought up after nourishment, which was chiefly water-gruel, a quantity of porraceous bile, I advised an emetic of ipecachuanha, which operated moderately.

"October 12. She was ordered to take 3 gr. mercur. dulcis, with 10 gr. of rhubarb; which, producing no effect, was repeated the next day somewhat stronger, but without effect, being brought up by vomiting a few hours after taking it. To allay this last symptom, a solution of conserve of roses, with the addition of vitriolic acid and opium, was also tried, but in vain.

"After this she became much reduced, living

entirely on water-gruel. One grain of vitriolum cœruleum was taken in a pill, but shortly after rejected with some seeds of water-melon, swallowed the preceding August. This occurred on the 20th of October. Imagining that I now perceived a hardness of the pylorus, I directed a drachm of ung. hydrarg. fort. to be rubbed every night on the region of the stomach, and, for the purpose of nourishment, clysters of mutton broth to be given three or four times in the day, which seemed to be beneficial to her, as her pulse became stronger. In this state she continued vomiting up the seeds of melons and grapes, using no medicine but the liq. vol. cornu cervi to relieve cardialgia and flatulency, and opium to procure sleep. By a shameful neglect of her attendants, the nourishing clysters, which were her sole support, were not regularly given. Delirium, from time to time, supervened, and the bilious vomiting continued. In this manner, with the addition of an aphthous state of the tongue, she remained until the 7th of November, when she died.

"The next morning I opened the body in the presence of several medical gentlemen. The heart and lungs were perfectly sound, the stomach appeared much enlarged and distended with flatus, containing also a quantity of fœtid ropy matter. The *pylorus was scirrhous*, and the passage into the duodenum scarcely pervious to a goose-quill. In that passage two damascene stones were impacted, so as to close it. The liver seemed sound; but, in the *vesica fellis*, was a gall-stone of the size of a mulberry. The pancreas was enlarged, and the mesenteric glands indurated. The intestines appeared in their natural state."

Dr. Harrison asks, Did not the long-continued practice of *swallowing fruit-stones* lay the foundation of this complaint in advanced years? We think the affirmative pretty evident; and hope the fatal event which attended that vulgar and senseless practice in the case just related (as well as many others upon medical record), will operate as a warning with those inconsiderate persons who may happen to observe it.

Many of the remedies of service in Dyspepsia and Pyrosis are applicable in this disease.

CARDIA'LGIA INFLAMMATO'RIA; inflammation in the stomach.

CARDIA'LGIA SPUTATO'RIA, i. e. pyrosis. See Pyrosis.

CARDIMO'NA; a name for the cardialgia.

CARDINAL FLOWER, BLUE. See Lobelia.

CARDINAME'NTUM, (from *cardo*, a hinge); a hinge-like articulation.

CARDIO'GMUS, (from καρδιώσσω, *to have a pain in the stomach)*; the same as cardialgia. It also denotes, an aneurism in the aorta, near the heart, which occasions pain in the præcordia.

CARDIO'NCHUS, an aneurism of the heart, or in the aorta, near the heart.

CARDIOSPE'RMUM; heart-pea, or heart-seed, a genus in Linnæus's botany. He enumerates two species.

CARDI'TIS, (from καρδια, *the heart)*; inflammation of the heart. This is a genus of disease arranged by Cullen in the class *Pyrexia*, and order *Phlegmasiæ*. It is known by pyrexia, pain in the region of the stomach, great anxiety, difficulty of breathing, cough, irregular pulse, palpitation, and fainting. Happily this disease occurs in very few instances. The causes are the same as in the pneumonia. See Pneumonia.

In the *carditis*, the prognosis is more unfavourable than in the pneumonia; and indeed, unless the disease very quickly terminates, it must prove fatal, on account of the constant and violent motion of the heart, which exasperates the inflammation, and increases all the symptoms. Here bleeding is necessary in as great a degree as the patient *can possibly bear*, together with blistering, and the anti-phlogistic regimen likewise carried to a greater height than in the pneumonia; but the general method is the same as in other inflammatory diseases. From the immediate connection of the parts, there may occur, at the same time, a paraphrenitis, or inflammation of the diaphragm. See Paraphrenitis.

CA'RDO, the articulation called *ginglymus;* also the second vertebra of the neck.

CARDO'NIUM: so Paracelsus calls wine medicated with herbs.

CARDOPA'TIA. See Chameleon albus.

CARDU'NCELLUS, dwarf blue Montpelier carthamus; a species of Carthamus.

CARDU'NCULUS, chardon, a species of Cynara.

CA'RDUUS, *(a carere, quia aptus carendæ lanæ*, being fit to tease wool); the thistle.

CA'RDUUS BENEDICTUS; the plant called blessed thistle, or holy thistle. It is the *centaurea benedicta; calycibus duplicato-spinosis lanatis involucratis, foliis semi-decurrentibus denticulato-spinosis* Linn. Class, *Syngenesia*. Order, *Polygamia frustranea*. This exotic plant obtained the name of benedictus, from its being supposed to possess extraordinary medicinal virtues. See Centaurea benedicta.

CA'RDUUS MARIA'NUS, or Mariæ. The seeds of this plant, *carduus marianus; foliis amplexicaulibus, hastato-pinnatifidis, spinosis; calycibus aphyllis; spinis caniliculatis, duplicatio spinosis* Linn. and the leaves also, have been employed medicinally. The former contain a bitter oil, and are recommended as relaxants. The juice of the latter is said to be salutary in dropsics, in the dose of four ounces. It is an article in some of the foreign pharmacopœias, but is not recognised in those of this country.

CA'RDUUS MARIÆ; a name of the officinal carduus marianus. See CARDUUS MARIANUS.

CA'RDUUS TOMENTO'SUS; the WOOLLY THISTLE. The plant which bears this name in the pharmacopœias, is the *onopordium acanthium calycibus squarrosis; squamis patentibus; foliis ovato-oblongis, sinuatis* Linn. Its expressed juice has been recommended as a cure for cancer, either applied by moistening lint with it, or mixing some simple farinaceous substance, so as to form a poultice, which should be placed in contact with the disease, and renewed twice a-day. It should rather be placed amongst the palliatives of that disease.

CARE'NA; the twenty-fourth part of a drop.

CA'REX, (from *careo*, not *quia viribus careat*, but because from its roughness it is fit *ad carendum*, to card, tease, or pull asunder), SEDGE; a genus in Linnæus's botany.

CA'REX ARENA'RIA; the systematic name of the officinal sarsaparilla Germanica. See SARSAPARILLA GERMANICA.

CA'RICA, (καρυκη, from *Carica*, the place where they were cultivated); the FIG. The plant which affords this fruit is the *ficus Carica* Linn. *ficus foliis palmatis*. Class, *Polygamia*. Order, *Triœcia*. Fresh figs are, when completely ripe, soft, succulent, and easily digested; but, when eaten immoderately, they occasion flatulency, pain of the bowels, and diarrhœa. The dried fruit, which is sold in our shops, is pleasanter to the taste, and more wholesome and nutritive. These are directed in the *decoctum hordei compositum*, and in the *electuarium e senna*. Applied externally, they promote the suppuration of tumors. Hence they have a place in maturating cataplasms; and are very convenient to apply to parts which cannot be poulticed in the common way. They are very commonly applied, being first roasted, to the gums; and, when boiled with milk, to abscesses forming in the throat.

CARICOUS TUMOR, called by Hippocrates καρυκοιδες; a swelling resembling the shape of a fig; such are frequently the piles; from *carica*, a fig.

CA'RIES, (from κειρω, *to abrade*; or from *karah*, to dig in, a Chaldee word); a partial mortification of the bone, which separates from the sound part sooner or later. Dr. Cullen names it *exulceratio ossis*. Indeed, every species of caries attended with the loss of subtance may, without impropriety, be termed an ulcer.

This corrupted state of the bone happens when it has lost its living principle, or when it is deprived of its periosteum, from which cause, having lost its natural colour, it becomes pinguinous, yellow, brown, and at last black. This state, which is the first degree of caries, was called by the ancients *os vitiatum*, or *ossis nigrities*; but the greatest degree is when the bone is corroded, discharging a sanies, which consumes the adjacent flesh. With the many names given to caries we have nothing to do; since, in the many cases which occur to surgeons, it is simple and obvious.

The signs and progress of this disease of the bone are the same in brutes as in the human subject. We shall here state the doctrines of medical writers as far as they bear a general application to the subject.

That an inflammation of the periosteum is tending to a caries of the bone, is known, first, from the signs of inflammation preceding; secondly, a freedom from pain in the affected part, without a manifest cause; thirdly, from a dense, slow, increasing, and not very painful tumor of the superincumbent parts. But, among the signs of a beginning caries of the bone, the sudden removal of pain is fallacious, for this happens in inflammation of the periosteum, when the latter is corroded so as to admit the matter to escape betwixt the muscles, though in general, when pain is relieved by a resolution of inflammation, it goes off gradually only; but a favourable resolution hardly, if ever, happens after a violent inflammation. Again, when a caries is threatened, the taint is propagated through the cellular membrane, which, by slight causes, is often raised into a large tumor. This has not the hardness and resistance observable in a tumor arising from phlegmon, but it will be flaccid, and hardly sensible of pain. We may readily, by means of a probe, discover a caries of the bone, since the probe will penetrate less or more, according as the caries is superficial or deep. When the probe comes to the sound part of the bone, it is resisted. If the bone be visibly bare, its state is easily discerned, though sometimes it is covered with a grumous matter, which, when rubbed off, discovers the bone of a dead white, brown, or black colour. If the white be porous, the caries may possibly be deeper than if black and hard. If the bone lies so hid as that we cannot feel it with a probe, yet sometimes we may judge it carious from the quantity and quality of the matter which is sanious. If the bone lies near the surface, and the flesh is lax and of an unnatural colour, it is strongly to be suspected that the bone is carious: but, *if the matter be fœtid and oily, it is still a more certain sign of caries.*

Ulcers of long continuance near a bone are sometimes forerunners of a *caries*. When *a carie is under an ulcer*, the flesh over the caries is soft, flaccid, and fungous; the lips of the ulcer inverted, the sanies thin, fœtid, and full of small black scales, nor can the ulcer be healed, at least only superficially, and it soon breaks out again. See ULCER.

Dr. Monro gives a particular account of several species of *caries* affecting the human subject; but these are too much in detail for our purpose in this place; nor do the methods to be resorted

to differ materially. What has been said will, therefore, suffice as far as the description of the disease is concerned: something must now be said of its treatment.

In considering the nature of a *caries*, we should remember, that the bones have their vessels and circulating fluids, and the same general texture as the soft parts: so that solidity, and a stronger cohesion of parts, are the only evident distinguishing characters of the composition of bone.

The cure of a *caries* depends on removing easily all the dead or decayed parts of the bone. In the simplest cases, this is done, 1st, By applying to the *caries* such medicines as tend to dissolve or waste it: 2dly, By applying to the living parts with which it is in *contact*, such stimulating remedies as may quicken absorption and aid the process of EXFOLIATION. In general, both these processes may be assisted by the same means; for instance, by the topical use of the vegetable or mineral acids, or by the actual cautery: but the last is by far the most effectual.

An exfoliation of the carious laminæ of a diseased cylindrical bone will sometimes take place in two or three weeks, and in other instances the laminæ remain much longer. It is of course necessary to examine strictly all circumstances attending the case, and to discover, if possible, what cause, general or topical, may have occasioned the caries, that endeavours may be used to remove it, if it still subsist.

When the bone is perceived to separate, if the pus which flows from under it is mild and in due quantity, nothing more is to be done but to remove the pieces of bone as often as they are perceived to be loose. If the opening in the integuments is so small that the matter detained is either absorbed into the circulation, or forms sinuous ulcers, the aperture must be enlarged by caustics or by means of sponge tents. Indeed, if the exfoliation is likely to be tedious, it should be hastened by the actual cautery.

But in general a mild treatment is to be preferred, since the natural powers of the system are vigorously exercised. In the slighter cases endeavour to excite and continue a degree of inflammation in the adjoining sound part of the diseased bone, so as that it may be the means of separating the mortified part. After all, however, caries of the bone spontaneously produced is a rare occurrence, except when preceded by some accident which sufficiently accounts for it. To a disease of the bone of an extraordinary kind, namely, EXOSTOSIS, the *caries ossis* stands opposed; but of this we shall treat under its particular name.

CARI'NA, in botany, a keel; the name which Linnæus gives to the lower concave petal of a pea-bloom, or butterfly-shaped flower, from its fancied resemblance to the keel of a ship. This is placed close under the upper petal, called the standard, *vexillum*; and within the two side petals, called wings, *alæ*. See VEXILLUM, and ALÆ. It incloses the *stamina*, and *pistillum*, and consists either of one petal, as in *cytisus;* or of two adhering pretty closely together; as in broom, *spartium;* and coral-tree, *erythrina*.

The *carina* is either, 1. *Lunulata*, i. e. shaped like a crescent; as in the *piscidia*, and *borbonia*. 2. *Bifida*, slightly cut in two: as in African-broom, *aspalathus*. 3. *Spiralis*, spirally twisted; as in kidney-bean, *phaseolus*. 4. *Incurva*, turning back; as in ground-nut, *arachis*. 5. *Ventriculosa*, bellying out in the middle; as in base tree trefoil, *cytisus;* or, 6. *Compressa*, flat, that is, pressed together at the sides; as in false acacia, *robinia;* and milk-wort, *polygala*.

The line that forms the keel in this irregular petal, runs straight as far as the middle, and then rises in the segment of a circle: but the marginal line runs straight to the *apex*, where the two lines meet, and terminate obtusely. The lower part of the base of the keel extends into a claw, which is inserted into the common receptacle, and of the length of the calyx. The sides resemble the wings in shape and situation, except in being lower, and standing within.

CARIOUS, an epithet applied to a foul bone, or one inclined to rottenness. See CARIES.

CARI'SSA, a genus in Linnæus's botany. There are two species.

CARLI'NA, or CAROLINA, (from *Carolus*, Charles the Great, or Charlemagne; because it was believed that an angel shewed it to him, and that, by the use of it, his army was preserved from the plague), also called *carolina;* the officinal names of two species of plants. See CHAMÆMELON ALBUM, and CARLINA GUMMIFERA.

CARLI'NA ACAU'LIS; the systematic name of the *chamæmelon album*.

CARLI'NA GUMMI'FERA, *Carduus pinea*, or *Ixine*; PINE-THISTLE. This plant is the *atractylis gummifera* Linn. The root, when wounded, yields a milky, viscous juice, which concretes into tenacious masses, at first whitish, resembling wax, and when much handled growing black; it is said to be chewed with the same views as mastich.

CARLINE THISTLE. See CHAMELEON ALBUM.

CA'RLO SA'NCTO RA'DIX, St. Charles's root; so called by the Spaniards, on account of its great virtues. It is found in Mechoachan, a province in America. Its bark gives an aromatic flavour, with a bitter acrid taste. The root itself consists of slender fibres. The bark is sudorific, and strengthens the gums and stomach.

CARLOCK, a sort of isinglass made of the membranous parts of a sturgeon. It is imported generally, as an article of commerce, from Arch-

angel. The best comes from Astracan, where sturgeons are caught in great abundance.

CARMINATIVES (*carminativa;* from *carmen*, a verse or charm; because practitioners in ancient times ascribed their operation to a charm or enchantment); a term at present applied to those substances, which allay pain, and dispel flatulencies of the primæ viæ. Such are aniseed, caraway, and other warm seeds.

CA'RNEÆ COLU'MNÆ; the fleshy pillars or columns in the cavities of the heart. See HEART.

CARNELIAN, a stone, of which there are three kinds, distinguished by their colours; *viz.* red, yellow, and white. The red is very well known. It is found in roundish or oval masses, much like our common pebbles; and is generally met with between an inch and two or three inches in diameter. It is of a fine, compact, and close texture; of a glossy surface; and, in the several specimens, is of all the degrees of red, from the palest flesh-colour to the deepest blood-red. It is generally free from spots, clouds, or variegations: but sometimes it is veined very beautifully with an extremely pale red, or with white; the veins forming concentric circles, or other less regular figures, about a nucleus, in the manner of those of agate. The pieces of carnelian which are all of one colour, and perfectly free from veins, are those of which the jewellers generally make seals. The carnelian is tolerably hard, and capable of a very good polish: it is not at all affected by acid menstrua: the fire divests it of a part of its colour, and leaves it of a pale red; and a strong and long continued heat will reduce it to a pale dirty grey. The finest carnelians are those of the East Indies; but there are good ones found in the rivers of Silesia and Bohemia; and we have some also in England.

CARNIVOROUS, an epithet applied to those animals which naturally seek and feed on flesh. It has been a dispute among naturalists, whether man is naturally carnivorous. Those who take the negative side of the question, insist chiefly on the structure of his teeth, which are mostly incisores or molares; not such as carnivorous animals are furnished with, and which are proper to tear flesh in pieces; to which it may be added, that, even when we do feed on flesh, it is not without a preparatory alteration by boiling, roasting, &c. But in fact the human race are furnished with teeth necessary for the preparation of all kinds of food; and from thence it would seem, that nature intended we should live on all. Some visionary writers have likewise disputed whether mankind were *carnivorous* before the flood. St. Jerom, Chrysostom, Theodoret, and other ancients, maintain, that all animal food was then forbidden; which opinion is also strenuously supported among the moderns by Curcellæus, yet refuted by Heidegger, Danzius, Bockhart, &c.

CARNOSITY; the same as CARUNCLE. This term is used by some authors for a little fleshy excrescence or tubercle, formed in the urethra, the neck of the bladder, or penis, which hinders the passage of the urine. These caruncles, however, have been demonstrated in few if any instances, by dissection; and Mr. Hunter denies their existence altogether.

CA'RO MONTANA, a species of leather-stone, of a laminated structure. It is found in Sweden.

CA'ROLI, a name given to chancres: also little venereal excrescences in the private parts.

CAROLI'NEA, a genus in Linnæus's botany. He has but one species.

CA'ROPI, the true AMOMUM.

CARO'RA, the name of a vessel that resembles an urinal.

CA'ROS, or CARUS: insensibility and sleepiness, with easy respiration.

CARO'TA; the CARROT. See DAUCUS.

CARO'TIDES, (Καρωτίδης; from καρόω, *to cause to sleep;* so called because if tied with a ligature, they cause the animals on which the experiment is made to be comatose, and have the appearance of being asleep); two considerable arteries that proceed, one on each side of the cervical vertebræ, to the head, and which supply it with blood. They arise near each other, from the curvature or arch of the aorta; the left immediately, the right most commonly, from the trunk of the subclavians on the same side. See ARTERIES.

They run upon each side of the trachea, between it and the internal jugular vein, and behind the musculi platysma-myoides, and sternocleido-mastoideus, and high as the larynx, without any ramification. During this course, therefore, Dr. Monro says, they may be named *carotid trunks*, or original carotids. Each of these trunks is afterwards ramified in the following manner:—The trunk, which sends off no branches till it has attained the larynx, is divided into two particular carotids; one named *external*, the other *internal;* because the first goes chiefly to the external parts of the head, the second enters the cranium, and is distributed to the brain. The external carotid is anterior, the internal posterior; and the external is even situated more inward and nearer the larynx than the other; but the common names may still be retained, as being taken, not from their situation, but from their distribution.

1. *Carotis externa.*—The external carotid is the smallest, and yet appears by its direction to be a continuation of the common trunk. It runs insensibly outward, between the external angle of the lower jaw and the parotid gland, which it supplies as it passes. Afterwards it ascends on the foreside of the ear, and ends in the temples. In this course it sends off several branches, which may well enough be divided into anterior or internal, and

posterior or external: and the principal branches of each kind are these.

(1.) The first anterior or internal branch goes out from the very origin of the carotid on the inside; and having presently afterwards taken a little turn, and sent off branches to the jugular glands near it, to the fat and skin, it runs transversely, and is distributed to the glandulæ thyroideæ, and to the muscles and other parts of the larynx; for which reason it may be called *laryngæa*, or *gutturalis superior*. It likewise sends some branches to the pharynx and muscles of the os hyoides.

(2.) The second anterior branch passes over the nearest cornu of the os hyoides to the muscles of that bone and of the tongue; and to the glandulæ sublingualis; afterwards passing before the cornu of the os hyoides, it loses itself in the tongue; from whence it has been called *sublingual;* and it is the same artery which other anatomists have named *ranina*. That part of the artery which goes commonly by this name lies at the inferior and lateral part of the tongue, and is accompanied by a large vein.

(3.) The third branch, or *maxillaris inferior*, and *pharyngea inferior* of Sabatier, goes to the maxillary gland, to the styloid and mastoid muscles, to the parotid and sublingual glands, to the muscles of the pharynx, and to the small flexors of the head.

(4.) The fourth branch, which Winslow and some others name *maxillaris externa*, and which Haller and Sabatier call *labialis*, is at first covered by the stylo-hyoid and diagastric muscles. In its passage it branches to the pharynx, to the tongue, amygdalæ, and palate; at the angle of the jaw it gives branches to the skin, muscles, glands, &c. in the neighbourhood of that bone. Afterwards it runs over the lower jaw, before the inferior edge of the masseter muscle, and then gets under the depressor anguli oris, which it supplies, as well as the buccinator and the depressor labii inferioris.

It sends off a branch, very much contorted, which divides at the angular commissure of the lips; and running in the same manner along the superior and inferior portions of the orbicularis muscle, it communicates on both sides with its fellow, and thereby forms a kind of arteria coronaria labiorum.

Afterwards it ascends towards the nares, and is distributed to the muscles, cartilages, and other parts of the nose, sending down some twigs which communicate with the coronary artery of the lips. Lastly, it reaches the great angle of the eye, and is ramified and lost on the musculus orbicularis palpebrarum, superciliaris, and frontalis. Through all this course it is named *angularis*.

(5.) The fifth branch, called *maxillaris interna*, arises over-against the condyle of the lower jaw, and is very considerable. It passes behind the condyle, and runs between the jaws, where it gives off numerous branches to the parts which lie near it. The most considerable of these are: α. The *spheno-spinalis*, or *media duræ matris*, which runs between the internal and external carotids: this passes through the foramen spinale of the sphenoidal bone, and is distributed to the dura mater by several ramifications, which run forward, upward, and backward; the uppermost communicating with those on the other side above the longitudinal sinus of the dura mater. This artery of the dura mater Dr. Monro has termed *spheno-spinalis* or *media duræ matris*, to distinguish it from those that go to the same part by another course. β. The *maxillaris inferior*, which runs through the canal of the lower jaw, and being distributed to the alveoli and teeth, goes out at the hole near the chin, and loses itself in the neighbouring muscles, communicating with the branches of the arteria maxillaris externa. γ. The *pterygoideæ*, and *temporales profundæ*, to the pterygoid and temporal muscles. δ. The *arteria buccalis*, to the buccinator muscle, and other soft parts of the cheek. η. The *alveolaris*, to the teeth and substance of the upper jaw, and to several of the soft parts surrounding it. θ. The *infra-orbitaria*, which, after sending a branch to the nose, passes through the posterior opening of the orbitar canal; and having sent branches to the orbit, antrum maxillare, and teeth, goes out by the infra orbitar hole, and on the cheek communicates with an angular artery. ε. *Palatina superior*, which goes through the palato-maxillary canal to the palate and bones surrounding it. Another small branch terminates on the parts at the upper end of the pharynx.

(6.) The sixth anterior or internal branch, which is very small, is spent on the masseter muscle.

The first external or posterior branch is named *arteria occipitalis*. It passes obliquely before the internal jugular vein; and having given twigs to the musculus stylo-hyoidæus, stylo-glossus, and digastricus, it runs between the styloid and mastoid apophyses, along the mastoid groove, and goes to the muscles and integuments which cover the os occipitis, turning several times in an undulating manner as it ascends backwards.

It communicates by a descending branch with the vertebral and cervical arteries, as has been already said, near the top of the head; it communicates likewise with the posterior branches of the temporal artery, and it sends a branch to the foramen mastoidæum.

The second external branch spreads itself on the outward ear, by a great many small twigs on each side, several of which run inward, and furnish the cartilages, meatus auditorius, skin of the tympanum, and internal ear.

The trunk of the external carotid ascends after-

ward above the zygoma, passing between the angle of the lower jaw and parotid gland, and forms the temporal artery, which divides into an anterior, middle, and posterior branch.

The anterior branch of the temporal artery goes to the musculus frontalis, communicates with the arteria angularis, and sometimes gives off a very small artery, which pierces the internal apophysis of the os malæ all the way to the orbit. The middle branch goes partly to the musculus frontalis, partly to the occipitalis. The posterior branch goes to the occiput, and communicates with the arteria occipitalis. All these branches likewise furnish the integuments with blood.

2. *Carotis interna.*—The internal carotid artery leaving the general trunk, is at first a little incurvated, appearing as if either it were the only branch of that trunk, or a branch of the trunk of the external carotid. Sometimes the curvature is turned a little outward, and then more or less inward, passing behind the neighbouring external carotid.

It is situated a little more backward than the carotis externa, and generally runs up without any ramification, as high as the lower orifice of the great canal of the apophysis petrosa of the os temporis. It enters this orifice directly from below upward, and afterward makes an angle according to the direction of the canal, the rest of which it passes horizontally, being covered by a production of the dura mater.

At the end of this canal it is again incurvated from below upward, and enters the cranium through a notch of the sphenoidal bone. Then it bends from behind, forward, and makes a third angle on the side of the sella sphenoidalis; and again a fourth, under the clinoid apophyses of that sella. While it lies at the side of the sella turcica, it sends small branches to the parts about the cavernous sinus.

As it leaves the bony canal to enter the cranium, it sends off a small branch through the sphenoidal fissure to the orbit and eye: and soon afterward a considerable branch, called *opthalmica*, through the foramen opticum, to supply the contents of the orbit. The first branches sent off from the ocular artery are very small; they go to the dura mater on the optic nerve, and the beginning of the muscles in the bottom of the orbit. Then the lachrymal and ciliary arteries are sent off: the artery, covered with the levator muscles of the eye and upper eye-lid, afterwards turns inwards, between these muscles and the optic nerve, almost at a right angle; but about the part where it makes this turn, it sends off anterior ciliary branches; afterwards two go off to the levator of the eye and upper eye-lid; then the posterior ethmoidal and the arteria centralis retinæ are sent off. While it passes over the nerve, it gives off the musculares superior, inferior, and other ciliary branches. It lies now at the inner side of the orbit, under the superior oblique and adductor muscles. These muscles, the periosteum, and inner part of the orbit and optic nerve, receive branches from it; then it produces the *ethmoidalis anterior:* its trunk next descends under the cartilaginous pulley of the superior oblique: here it frequently gives a branch to the lachrymal sac; the arteries of the eye-lids also grow from it; at last it divides into four branches, namely, the superciliary, the nasal, the superficial, and deep frontals; which last go through the foramen supra orbitarium to be distributed to the forehead. At the inner angle of the eye, it communicates with the angular artery; and within the orbit it sends one or two small branches to the nose. This artery was by the ancients mistaken for a vein.

Afterwards the internal carotid runs under the basis of the brain to the side of the infundibulum, where it is at a small distance from the internal carotid of the other side, and there it commonly divides into two principal branches, one anterior and one posterior.

The anterior branch runs forward under the brain, first separating from that on the other side, then, coming nearer again, it unites with it by an anastomosis or communication in the interstice between the olfactory nerves. Afterwards, having sent off small arteries, which accompany these nerves, it leaves its fellow, and divides into two, but, according to Winslow, two or three, branches. The first of these is the smallest of the two, but it is very constant; it runs forward to the inner side of the anterior lobe, which it supplies in its passage. The second, after it has got beyond the corpus callosum, to which it sends branches, is reflected back over that substance upon the inner side of the hemisphere, and may be traced back as far as the posterior lobe: in all this course it sends off innumerable branches, which are at first spread out upon the surface, and afterwards sink into the substance of the brain, communicating freely with the ramifications of the posterior trunk.

The posterior branch communicates first of all with the vertebral artery of the same side, and after running between the anterior and lateral lobes of the brain, divides into several rami, which run between its superficial circumvolutions; and are ramified in many different directions on and between these circumvolutions, all the way to the bottom of the sulci.

All these ramifications are covered by the pia mater, in the duplicature of which they are distributed, and form capillary reticular textures in great numbers; and afterwards they are lost in the inner substance of the brain. The anterior and

middle branches produce the same kind of ramifications, and the anterior, in particular, supplies the corpus callosum with blood.

The want of facts to determine the extent to which we may venture to stop the circulation of the blood in the larger arteries, has led to the conclusion that a ligature could not safely be affixed on either of the carotids. A valuable fact of this kind, with the attending circumstances has lately been published, in his "Surgical Observations," by Mr. Abernethy, surgeon of St. Bartholomew's Hospital in London. See the article CIRCULATION.

CA'ROUM, a name given, in the old writers, to caraway. See CARUM.

CARP, or CARPIO, a species of the cyprinus, a genus of fish comprising above thirty species. Carp are also called white-fish, on account of their glittering scales, and are distinguished from other fish, by having no teeth, the want of which is supplied by several small rough bones fixed in the throat. Their properties as aliment are spoken of under FISH. Dr. Willich says, "of all animal substances, carp is doubtless the most liable to putrescency; and as its fat is indigestible, it ought particularly to be avoided by febrile patien s, invalids, and convalescents."

CA'RPASUS, a herb not at present known; but its juice was poisonous, and, was formerly called OPOCARPASON, or OPOCARPATHON.

CARPA'THICUS BA'LSAMUS; also called *oleum germanis*, and *carpathicum*. This balsam is obtained both by wounding the young branches of the *Pinus cembra, foliis quinis, lævibus*, Linn. and by boiling them. It is mostly diluted with turpentine, and comes to us in a very liquid and pellucid state, in general of a whitish colour.

CARPE'SIUM, nodding star-wort, a genus in Linnæus's botany. There are two species.

CA'RPHOS, (καρφος); a term used in Hippocrates to signify a straw, or mote, or any small substance. Also a small pustule, for the cure of which Aëtius recommends rubbing with the dried seeds of the herb mercury.

CA'RPIA, lint. See LINT.

CA'RPINUS, the hornbeam-tree, a genus in Linnæus's botany. He enumerates two species.

CARPOBA'LSAMUM, (from the Greek καρπος, *fruit*, and βαλσαμον, *balsam*); the fruit of the *amyris gileadensis* Linn. or balsam tree. See BALSAMUM GILEADENSE.

CARPO'BOLUS, a species of *lycoperdon*.

CARPOLI'THUS, a variety of the black species of nodulous stones. It is beset with green or white kernels, or nodules, which frequently possess a degree of transparency.

CARPOLO'GIA, a delirious fumbling, as, when a patient seems to be gathering something from the bed-cloaths, which yet is difficultly performed, because of the trembling which affects his hands. It is generally a fatal symptom.

CA'RPOS, (καρπος); a seed or fruit.

CA'RPUS, (καρπος, *the wrist*); the WRIST or carpus. It is composed of eight small spongy bones, situated at the upper part of the hand. Dr. Monro describes each of these bones, under a proper name which is taken from their figure; because the method of ranging them by numbers leaves anatomists too much at liberty to dispute, without any utility, which ought to be preferred to the first number. What is worse indeed, several, without explaining the order they observe, apply the same numbers differently, and so render their descriptions unintelligible. He therefore begins with the range of bones that are concerned in the moveable joint of the wrist, or that connected to the fore-arm, and afterwards describes the four that support the thumb and metacarpal bones of the fingers.

The eight bones of the CARPUS are thus situated: The *scaphoides* most internally of those that are articulated with the fore-arm:—The *os lunare* immediately on the outside of the former:—The *cuneiforme* is placed still more externally, but does not reach so high up as the other two: the *pisiforme* stands forwards in the palm from the *cuneiforme*: the *trapezium* is the first of the second row, and is situated between the scaphoides and first joint of the thumb: the *trapezoides* is immediately on the outside of the trapezium: the *os magnum* is still more external: the *unciforme* is placed farther to the side of the little finger.

1. The *os scaphoides* is the largest of the eight, excepting one. It is convex above, concave and oblong below: from which small resemblance to a boat, it has got its name. Its smooth convex surface is divided by a rough middle fossa, which runs obliquely across it. The upper largest division is articulated with the radius. The common ligament of the joint of the wrist is fixed into the fossa; and the lower division is joined to the trapezium and trapezoides. The concavity receives more than an half of the round head of the os magnum. The external side of this hollow is formed into a semilunar plane, to be articulated with the following bone.—The internal, posterior, and anterior, edges are rough, for fixing the ligaments that connect it to the surrounding bones.

2. The *os lunare*, or *lunatum*, has a smooth convex upper surface, by which it is articulated with the radius. The internal side, which gives name to the bone, is in the form of a crescent, and is joined with the scaphoid: the lower surface is hollow, for receiving part of the head of the os magnum. On the outside of this cavity is another smooth, but narrow, oblong sinuosity, for receiving the upper end of the os unciforme: and it has also a small convexity, for its connection with the latter.

Between the great convexity above, and the first deep inferior cavity, there is a rough fossa, in which the circular ligament of the joint of the wrist is fixed.

3. The *os cuneiforme*, or *triquetrum*, is broader above, and towards the back of the hand, than it is below and forwards; which gives it the resemblance of a wedge. The superior slightly convex surface is included in the joint of the wrist, being opposed to the latter end of the ulna. Below this, the cuneiform bone has a rough fossa, wherein the ligament of the articulation of the wrist is fixed. On the internal side of this bone, where it is contiguous to the os lunare, it is smooth and slightly concave. Its lower surface, where it is contiguous to the os unciforme, is oblong, somewhat spiral, and concave. Near the middle of its anterior surface a circular plane appears, where the os pisiforme is sustained.

4. The *os pisiforme* is almost spherical, except one circular plane, or slightly hollow surface, which is covered with cartilage for its motion on the cuneiform bone, from which its whole rough body is prominent forwards into the palm; having the tendon of the flexor carpi ulnaris, and a ligament from the styloid process of the ulna, fixed to its upper part: the transverse ligament of the wrist is connected to its internal side, ligaments extending to the unciform bone, and to the os metacarpi of the little finger, are attached to its lower part; the abductor minimi digiti has its origin from its fore-part: and, at the internal side of it, a small depression is formed, for the passage of the ulnar nerve.

5. The *trapezium*, or *cubiforme*, has four unequal sides and angles in its back-part, from which it has got its name.—Above, its surface is smooth, slightly hollowed, and semicircular, for its conjunction with the os scaphoides—Its external side is an oblong concave square, for receiving the following bone. The inferior surface is formed into a pulley; the two protuberant sides of which are external and internal. On this pulley the first bone of the thumb is moved. At the external side of the external protuberance, a small oblong smooth surface is formed by the os metacarpi indicis. The fore-part of the trapezium is prominent in the palm, and near to the external side has a sinuosity in it, where the tendon of the flexor carpi radialis is lodged; on the ligamentous sheath of which the tendon of the flexor tertii internodii pollicis plays: and still more externally, the bone is scabrous; where the transverse ligament of the wrist is connected, the abductor and flexor primi internodii pollicis have their origin, and ligaments go out to the first bone of the thumb.

6. The *os trapezoides*, or *trapezium*, so called from the irregular quadrangular figure of its back-part, is the smallest bone of the wrist except the *pisiforme*. The figure of it is an irregular cube. It has a small hollow surface above, by which it joins the scaphoides; a long convex one internally, where it is contiguous to the trapezium; a small external one, for its conjunction with the os magnum; and an inferior convex surface, the edges of which are, however, so raised before and behind, that a sort of pulley is formed, where it sustains the *os metacarpi indicis*.

7. The *os magnum*, *maximum*, or *capitatum*, so called because it is the largest bone of the carpus, is oblong, having four quadrangular sides, with a round upper end, and a triangular plain one below. The round head is divided by a small rising, opposite to the connection of the os scaphoides and lunare, which together form the cavity for receiving it. On the inside a short plain surface joins the os magnum to the trapezoides. On the outside is a long narrow concave surface, where it is contiguous to the os unciforme. The lower end, which sustains the metacarpal bone of the middle finger, is triangular, slightly hollowed, and farther advanced on the internal side than on the external, having a considerable oblong depression made on the advanced inside by the metacarpal bone of the fore-finger; and generally there is a small mark of the os metacarpi digiti annularis on its external side.

8. The *os unciforme*, also named *cuneiforme*, is so called from a thin broad process that stands out from it forwards into the palm, and is hollow on its inside, for affording passage to the tendons of the flexors of the fingers. To this process also the transverse ligament is fixed that binds down and defends these tendons; and the flexor and abductor muscles of the little finger have part of their origin from it. The upper plain surface is small, convex, and joined with the os lunare. The internal side is long, and slightly convex, adapted to the contiguous os magnum. The external surface is oblique, and irregularly convex, to be articulated with the cuneiform bone. The lower end is divided into two concave surfaces; the external is joined with the metacarpal bone of the little finger; and the internal one is fitted to the metacarpal bone of the ring-finger.

In the description of the preceding eight bones, there is only mention made of those plain surfaces covered with cartilage, by which they are articulated to each other, or to some other bones, except in some few instances. But these scabrous parts of the bones may easily be understood after mentioning their figure, if it is observed, that they are generally found only towards the back or palm of the hand; that they are all plain, larger behind than before; and that they receive the different ligaments, by which they are either connected to neighbouring bones or to one another; for these ligaments cover all the bones, and are so accurately ap-

plied to them, that at first view the whole carpus of a recent subject, appears to consist merely of one smooth bone.

As the surfaces of these bones are largest behind, the figure of the whole conjoined must be convex there, and concave before; which concavity is still more increased by the os pisiforme, and process of the os unciforme, standing forwards on one side, as the trapezium does on the other: and the bones are securely kept in this form by the broad strong transverse ligament connected to those parts of them that stand prominent into the palm of the hand. The convexity behind renders the whole fabric stronger, where it is most exposed to injuries; and the large anterior hollow is necessary for a safe passage to the numerous vessels, nerves, and tendons of the fingers.

The *substance* of the bones which constitute the wrist is spongy and cellular, but strong notwithstanding, in respect of their bulk.

The three first bones of the carpus make an oblong head, by which they are *articulated* with the cavity at the lower end of the fore-arm, so as to allow motion on all sides; and by a quick succession of these motions, they may be moved in a circle. But as the joint is oblong, and therefore the two dimensions are unequal, no motion is allowed to the carpus round its axis, except what it has in the pronation and supination along with the radius. The articulation of the first three bones of the superior row with the bones of the inferior, is such as allows of motion, especially backwards and forwards; to the security and easiness of which, the reception of the os magnum into the cavity formed by the scaphoides and lunare considerably contributes: and the greatest number of the muscles that serve for the motion of the wrist on the radius, being inserted beyond the conjunction of the first row of bones with the second, act equally on this articulation as they do on the former; but the joint formed with the radius being the most easily moved, the first effect of these muscles is on it; and the second row of the carpus is only moved afterwards. By this means a larger motion of the wrist is allowed than otherwise it could have had safely: for if as large motion had been given to one joint, the angle of flexion would have been much too acute, and the ligaments must have been longer than was consistent with the firmness and security of the joint. The other articulations of the bones here being by nearly plain surfaces, scarcely allow of any more motion, because of the strong connecting ligaments, than to yield a little, and so elude the force of any external power; and to render the back of the wrist a little more flat, or the palm more hollow when required.

The *use* of the wrist is to serve as a base to the hand, to protect its tendons, and to afford it a free and various motion. All the bones of which it consists are in a cartilaginous state in the fœtus.

In consequence of the numerous tendons that pass upon the lower end of the fore-arm and the carpus, and of the different ligaments of these tendons and of the bones, which have lubricating liquors supplied to them, the pain occasioned by violent sprains of the wrist is very acute, the parts take a long time to recover their tone, and their swellings are very difficult to manage.

CARROT. See Daucus.

CARROT, CANDY. See Daucus creticus.

CA'RTHAMUS, (καρθαμος; from καθαιρω, *to purge)*; safflower. *Carthamus tinctorius; foliis ovatis, integris, serrato aculeatis*, Linn. This plant is cultivated in many places on account of its flowers, which are used as a yellow dye. The seeds of carthamus have been celebrated as a cathartic; but they operate very slowly, and for the most part disorder the stomach and bowels, especially when given in substance. Triturated with distilled aromatic waters, they form an emulsion less offensive, but inferior in efficacy to the more common purgatives. They are greedily eaten by a species of Egyptian parrot, though to other birds or beasts they are said to prove poisonous.

CA'RTHAMUS TINCTO'RIUS; the systematic name of the safflower plant. See Carthamus.

CARTHUSIA'NUS PULVIS, a name given to the Kermes Mineral. See Antimonium.

CARTILA'GO, *(quasi carnilago*; from *caro*, flesh), cartilage; a white, elastic, glistening substance, growing to bones, and commonly called *gristle.* Cartilages are solid, smooth, white, elastic substances, of a texture between the hardness of bone and the yielding nature of ligament, and covered with a membrane named *perichondrium;* which is of the same structure and use to them as the periosteum is to the bones.

Cartilages are composed of plates, which are formed of fibres, disposed much in the same way as those of bones are; as might be reasonably concluded from observing bones in a cartilaginous state before they ossify, and from seeing, on the other hand, so many cartilages become bony. This may be still further confirmed by the exfoliation which cartilages are subject to as well as bones.

The perichondrium of some cartilages, such as those of the ribs and larynx, has arteries, which may be injected equally well with those of the periosteum; but the vessels of that membrane in other parts, (as in the articular cartilages), are smaller, and in none of them does injection enter deep into the substance of the cartilages: madder, given as food to animals, does not change the colour of their cartilages as it does that of bones.

The fleshy granulations which arise from the ends of the metacarpal or metatarsal bones, when the cartilage exfoliates, after a finger or toe has been amputated at the first joint, are very sensible;

and from hence the existence of nerves in cartilages may be inferred with great justice.

While cartilages are in a natural state, it is to be remarked, 1. That they have no cavity in their middle for marrow. 2. That their outer surface is softest, which renders them more flexible. 3. That they do not appear to change their texture near so much by acids as bones do. 4. That as the specific gravity of cartilages is near a third less than that of bones, so the cohesion of their several plates is not so strong as in bones; whence it is that cartilages, when laid bare in wounds or ulcers, are not only more liable to corrupt, but also exfoliate much sooner than bones do.

Havers supposes, that cartilages are principally kept from ossifying, either by being subjected to alternate motions of flexion and extension, the effects of which are very different from any kind of simple pressure; or by being constantly moistened. Thus the cartilages on the articulated ends of the great bones of the limbs, and the moveable ones placed between the moving bones in some articulations, which are obliged to suffer many and different flexions, and are plentifully moistened, scarce ever change into bone; while those of the ribs and larynx are often ossified. The middle angular part of the cartilages of the ribs, which is constantly in an alternate state of flexion and extension, by being moved in respiration, is always the last in becoming bony. In the larynx, the epiglottis, which is oftener bended and more moistened than the other four cartilages, is seldom ossified, while the others as seldom escape it in adults.

The cartilages subservient to bones are sometimes found on the ends of bones which are joined to no other; but are never wanting on the ends and in the cavities of such bones as are designed for motion. Cartilages also are interposed between such other cartilages as cover the heads and cavities of articulated bones; nay, they are also placed between immoveable bones, as in the symphisis pubis, &c.

The manifest *uses* of cartilages are, to allow, by their smoothness, such bones as are designed for motion, to slide easily, and without attrition; while, by their flexibility, they accommodate themselves to the several figures necessary in different motions, and, by their elasticity, they recover their natural position and shape as soon as the pressure is removed. This springy kind of force may also lessen the shocks to which the joints would be exposed in running, jumping, &c. To these cartilages we chiefly owe the security of the moveable articulations: for, without them, the bony fibres would sprout out, and intimately coalesce with the adjoining bone; whence a true anchylosis must necessarily follow; which never fails to happen when the cartilages are eroded by acrid matter, or ossified from want of motion or defect of synovia, as we see often happens after wounds of the joints, pedarthrocace, scrophula, and spina ventosa, or from old age, and long immobility of joints. Hence we may know what the annihilation is, which is said to be made of the head of a bone, and of the cavity for lodging it, after an unreduced fracture. The moveable cartilages interposed in joints serve to make the motions both freer and more safe than they would otherwise be. Those placed on the ends of bones that are not articulated, as on the spine of the os ilium, base of the scapula, &c. serve to prevent the bony fibres from growing out too far.

Cartilages sometimes serve as ligaments, either to fasten together bones that are immoveably joined, such are the cartilages between the os sacrum and ossa ilium, the ossa pubis, &c. or to connect bones that enjoy manifest motion, as those do which are placed between the bodies of the true vertebræ, &c. Cartilages very often do the office of bones to greater advantage than these last could; as in the cartilages of the ribs, those which supply brims to cavities, &c. Too great thickness or thinness, length or shortness, hardness or suppleness, of cartilages, may therefore cause great disorders in the human frame.

CARTILA'GO ANNULA'RIS, the *annular cartilage*. See CARTILAGO CRICOIDEA.

CARTILA'GO ARYTÆNOIDÆ'A, or CARTILAGINES ARYTENOIDEÆ. These are two small, equal, similar cartilages, which, joined together, resemble the spout of an ewer; and they are situated on the top of the cricoides. In each, we may observe the basis; cornua; two sides, one posterior and concave, the other anterior and convex; and two edges, one internal, the other external, which is very oblique. The bases are broad and thick; and have each a concave articular surface, by which they are joined to the cricoides.

The cornua are bent backward, and a little toward each other. In some subjects they are very loose, appearing like true appendices, and easily separable from the rest. Between their inner edges they form a kind of fissure, and their outer oblique edges each terminate by a thick prominent angle.

CARTILA'GO CRICOIDEA; a cartilage which belongs to the larynx, and is situated between the thyroid and arytenoid cartilages and the trachea; constituting, as it were, the basis of the many annular cartilages of the trachea.

The cricoid cartilage resembles a kind of thick, irregular ring, very broad on one side, and narrow on the other; or it may be compared to a small portion of a thick tube, cut horizontally at one end, and very obliquely at the other; and it is distinguished into a basis and top, into an anterior, posterior, and two lateral sides. The basis is almost horizontal when we stand; and to this the trachea is directly connected; so that the cricoides may

be looked upon as the upper extremity of the trachea.

The posterior portion of the cricoides is larger than the rest; and its posterior or convex side is divided by a longitudinal eminence, or prominent line, into two distinct surfaces, for the insertion of muscles. The top is gently sloped above this prominent line; and terminates on each side by a kind of obtuse angle, formed between it and the oblique edge of each lateral portion of this cartilage. At the upper part of each of these angles, there is a very smooth, gently convex, articular surface.

The whole posterior side is distinguished into two lateral portions by two prominent lines, each of which runs down almost in a straight direction from the articular surface at the top, a little below the middle of this side, where it terminates in another articular line a little concave; and near these four articular surfaces there are small tubercles. The two superior surfaces are for the articulation of the *cartilagines arytenoideæ*, and the two inferior for the articulation of the inferior cornua or appendices of the *cartilago thyroidæa*.

CARTILA'GO ENSIFO'RMIS, (from ξιφος, *ensis, a sword*, and ειδος, *forma, shape)*, also called *Xiphoidea*, is the tip or extremity of the sternum, which is broad at its upper end, and, narrower towards the extremity, where it is sometimes a little forked. See Sternum.

CARTILA'GO INNOMINA'TA, so called by Galen, is the same as the moderns call *annularis*, or *cricoidea;* which is the second cartilage of the larynx, and, according to Bartholine, is the basis of all the others.

CARTILA'GO SCUTIFORMIS; another name for the *thyroid cartilage.* See Cartilago Thyroidæa.

CARTILA'GO THYROIDÆ'A, (from θυρεος, *a shield*, and ειδος, *resemblance;* from its supposed likeness to a shield); the thyroid, or scutiform, cartilage, which is placed perpendicular to the cricoid cartilage, constituting the anterior, superior, and largest part of the larynx. This cartilage is large and broad, and folded in such a manner as to have a longitudinal convexity on the foreside, and two lateral portions, which may be termed *alæ*. The upper part of its anterior middle portion is formed into an angular notch; the upper edge of each ala makes an arch; and, together with the middle notch, these two edges resemble the upper part of an ace of hearts in playing-cards.

The lower edge of each ala is more even, and the posterior edges of both are very smooth, being lengthened out, both above and below, by apophyses, which we name the *cornua of the thyroid cartilage.* The superior apophyses are longer than the inferior, and the extremities of all the four are rounded like small heads, which in the inferior apophyses have a shining surface on the inside, resembling an articular eminence.

On the outside of each ala, near the edge, is a prominent oblique line, which runs from behind forward. The upper extremity of this line is near the superior apophysis or cornu; and both that and the lower extremity end in a small tuberosity, the lowest being often the most considerable. These tuberosities serve for the insertion of muscles and ligaments. The inside of the alæ and the convex side of the anterior portion are very uniform; and this cartilage ossifies gradually in old age.

CARTILA'GO XYPHOIDE'A. See Cartilago ensiformis.

CA'RUM, or Caruon, (καρος; so named from *Caria*, a province of Asia), *Carum* or *careum;* common caraway. It is the *carum carui* Linn. Class, *Pentandria.* Order, *Digynia.* In the natural method ranking under the 45th order, *Umbellatæ.* The fruit is ovate, oblong, and striated; the involucrum monophyllous; the petals are carinated or keel-shaped below, and emarginated by their inflection. The species are, 1. The *carui*, or caraway of the shops, grows naturally in many parts of Britain. It is a biennial plant, which rises from seeds one year, flowers the next, and perishes soon after the seeds are ripe. It has a taper root like a parsnip, but much smaller, which runs deep into the ground, sending out many small fibres. It has a strong aromatic taste. From the root arise one or two smooth, solid, channelled stalks, about two feet high, garnished with winged leaves, having long naked foot-stalks. 2. The *hispanicum* is also a biennial, and is a native of Spain. It rises with a stronger stalk than the former, which seldom grows more than a foot and a half high; but is closely garnished with fine narrow leaves like those of dill. Both these plants are propagated by seeds, sown in autumn. Mr. Parkinson says, the young roots of caraway are better eating than parsnips. The tender leaves are sometimes boiled with potherbs. The seeds are well known to have a pleasant spicy smell, and a warm aromatic taste, and, on this account, are used for various economical and pharmaceutical purposes. They are esteemed to be carminative, cordial, and stomachic, and are recommended in dyspepsia, flatulencies, and other symptoms attending hysterical and hypochondriacal disorders. An essential oil and distilled water are directed to be prepared from them by the London college.

CA'RUM CA'RUI; the systematic name for the plant whose seeds are called caraways. See Carum.

CARU'NCULA, a caruncle, a term denoting a little raw wart or piece of flesh. The term is applied to these substances naturally existing in several parts of the human body; and also to those that are morbid. *Caruncles in the urethra*, have been said to proceed from a gonorrhœa, or an ulceration of the urethra; but late anatomists, particularly Mr. Hunter, have denied that such substances

are ever discovered on dissection, except at a very short way down the urethra.

CARU'NCULA LACHRYMA'LIS; a small reddish granulated, oblong body, situated precisely between the internal angle of the palpebræ and globe of the eye, but it is not fleshy, as its name would insinuate. The substance of it seems to be wholly glandular; and it appears through a single microscope in the same manner as the other conglomerate glands. We discover upon it a great number of fine hairs, covered by an oily yellowish matter, furnished by this gland; and, on the globe of the eye, near this glandular body, we see a semilunar fold formed by the conjunctiva, the concave side of which is turned to the uvea, and the convex side to the nose. This fold, which has the name of *membrana semilunaris*, appears most when the eye is turned toward the nose: it is shaped like a crescent, the two points of which answer to the puncta lachrymalia, and conduct the tears into the puncta.

CARU'NCULÆ MYRTIFO'RMES. When the hymen has been lacerated in coition, there remain in its place, two, three, or four caruncles, which have the name of myrtiform from their resemblance to myrtle berries.

CARU'NCULÆ PAPILLA'RES; the protuberances within the pelvis of the kidney, formed by the papillous substance of the kidney. See KIDNEY.

CA'RUON. See CARUM.

CA'RUS, insensibility and sleepiness, with quiet respiration. It sometimes signifies a loss of sense and voluntary motion, the respiration remaining uninjured. The same authors call the disease an *apoplexy*, if, to this is added, an oppressed respiration to a considerable degree, or so as to cause the patient to snort or snore. Sometimes, it signifies a profound sleep, but without fever. See APOPLEXIA. The species described by nosologists are: 1. *Carus a frigore*, i. e. *Apoplexia sanguinea.* 2. *Carus a hydrocephalo*, i. e. *Apoplexia serosa.* 3. *Carus ab insolatione*, i. e. *Ictus solaris.* 4. *Carus spontaneus*, i. e. *Apoplexia sanguinea.* See APOPLEXIA.

CA'RVA, a name for the cassia lignea tree.

CA'RVI, CARAWAY; a name for the first species of *Carum.* See CARUM.

CARVIFO'LIA; a species of *selinum.*

CARYO'CAR; a genus in Linnæus's botany, of which there is but one species. It is of the tetragynia order, belonging to the polyandria class of plants. The calyx is quinquepartite, the petals five, the styles more frequently four. The fruit is a plum, with nuclei, and four furrows netted. Its medical virtues are disregarded.

CARYO'CES, a Portuguese name for the fruit of the Guinea palm-tree.

CARYOCO'STINUM, a name for the *Elect. e. Scammonio.*

CA'RYON, (from καρυα, *a nut*). This word, in ancient writings, is applied to all such fruits as inclose somewhat eatable within a hard shell. Plutarch says that the ancients called the walnut *caryon*, because they supposed it to occasion a heaviness and stupidity. See CARUS.

CA'RYON BASI'LICON, the walnut.

CA'RYON LE'PTON, (from λεπτος, *small*), a small nut, as the filbert or hazel-nut.

CARYOPHYLLÆ'US, (from *caryophyllus*, Tournefort's name for the clove gilly-flower, or carnation pink, and the clove-tree), in botany, an epithet applied to a flower, whose petals, generally five in number, are disposed like those of the clove gilly-flower. These are the *fleurs en œillet* of the French. They have a hollow calyx or empalement of one piece, into the bottom of which are inserted the claws of the petals. These are of the same length with the calyx. The upper part of the petal is broad, plain, and disposed on the margin of the empalement like a wheel. Botanists include, under this description, the cucubalus; lychnis; viscous campion, *silene;* stellaria; cerastium; and several other plants.

CARYOPHYLLA'TA, (καρυοφυλλαλα; from καρυοφυλλοι, the caryophyllus; so named because it smells like the caryophyllus, or clove gilly-flower); AVENS, or herb-bennet. The root of this plant, *geum urbanum floribus erectis, fructibus globosis villosis, aristis uncinatis nudis, foliis lyratis*, of Linnæus, has been employed as a gentle styptic, corroborant, and stomachic. It is a rough plant, with dark coloured winged leaves and pentapetalous yellow flowers, standing in ten-leaved cups, on the tops of the branches; the seeds are hairy, the roots are slender, full of fibres, of a dark brownish colour on the outside, and reddish within. It is perennial, grows wild in woods and hedges, and is found in flower, the greatest part of the summer, in many parts of England. It has a mildly austere, somewhat aromatic smell, of the *clove* kind, as its name implies. It is also esteemed on the continent as as febrifuge remedy, and forms an article in the Russian, Austrian, and Prussian Pharmacopœias.

Dr. Cullen says the root is considerably astringent, and has some aroma when it has been recently raised in the spring-season and from a dry soil. The sensible qualities of it however are not, any more than its medical virtues, very considerable. A Danish physician, supported by the testimony of some of the most eminent physicians of that country, has represented the roots of the caryophillata as a powerful remedy in intermittent fevers; and besides enumerating many cases in which it had made a cure when given alone, he enumerates several in which it made a cure when the cinchona had failed: and these experiments have been confirmed by that of other physicians in Germany

and Sweden, particularly by Weber professor at Kiel.

It is acknowledged nevertheless, even by Buchave and Weber, that this root failed in several instances when the cinchona proved a remedy. The Swedish experiments have not been so favourable as those of the Danes and Germans to the credit of the caryophillata: with the former, in very few instances it succeeded; and in very many it failed. Considering the partiality of the accounts given us by the inventors of new medicines, Dr. Cullen says, we must be doubtful of those made by the partizans of the caryophillata, till we have had further experience of its effects.

CARYOPHY'LLEI, in botany, the name of a very numerous family, or order, in Linnæus's Fragments of a Natural Method. It contains, besides the class of the same name in Tournefort, many other plants, which, from their general appearance, seem to be allied to it. The *genera* contained in this natural order are:

1. *Carnation-like plants with a hollow calyx of one piece, and five petals:* viz. *Agrostemma*, campion, or wild lychnis; *cucubalus*, berry-bearing chick-weed; *dianthus*, clove gilly-flower, or carnation-pink; *drypis; gysophila; lychnis*, campion; *saponaria*, soap-wort; *silene*, viscous campion; *velezia.*

2. *Carnation-like plants with a calyx of more pieces than one, and five petals;* as in *alsine*, chick-weed; *arenaria*, sandwort; *bufonia; cerastium*, mouse-ear chick-weed; *cherleria; glinus; holosteum; loeflingia; moehringia*, mountain chick-weed; *polycarpon; sagina*, pearl-wort; *spergula*, spurrey; *stellaria*, great chick-weed.

3. *Carnation-like plants with a calyx of more pieces than one, and no petals:* viz. *Minuartia; mollugo; ortegia; pharnaceum;* and *queria.*

To this order there have been annexed, though improperly, two other *genera*, which cannot be arranged under any of the foregoing sections: viz. *Polypremum*, Carolina flax; and *scleranthus*, German knot-grass, or knawel. Dr. Milne informs us, that the former has a calyx of four pieces, and one wheel-shaped petal; the latter a hollow calyx of one piece and no petals.

CARYOPHY'LLEI, the name of the eighth class in Tournefort's, and sixteenth in Pontedera's method. These consist of *herbaceous* plants, whose flowers answer to the description given under CARYOPHYLLÆUS. The carnation; pink; clove-tree; lychnis; soap-wort; cucubalus; flax, *linum;* and thrift, or sea gilly-flower, *statice;* are the caryophyllei of Tournefort.

CARYOPHYLLOI'DES CORTEX. See CULILAWAN.

CARYOPHY'LLUM, (καρυοφυλλον; from καρυω, *a nut*, and φυλλον, *a leaf);* so named because it smells like the leaves of the Indian nut or clove-tree.

CARYOPHY'LLUM AROMATICUM; the CLOVE. The tree which affords this spice is the *caryophyllus aromaticus, foliis ovato-lanceolatis oppositis, floribus terminalibus.* Mill. Dict. Class, *Polyandria.* Order, *Monogynia.* In the natural method ranking under the 19th order, *Hesperideæ.* The corolla is tetrapetalous; the calyx tetraphyllous; the berry monospermous, below the receptacle of the flower. Of this there is but one species, viz. the aromaticus, which is a native of the Molucca islands, particularly of Amboyna, where it is principally cultivated. The clove-tree resembles, in its bark, the olive; and is about the height of the laurel, which it also resembles in its leaves. No verdure is ever seen under it. It has a great number of branches, at the extremities of which are produced vast quantities of flowers, that are first white, then green, and at last pretty red and hard. When they arrive at this degree of maturity, they are, properly speaking, *cloves.* As they dry, they assume a dark yellowish cast; and, when gathered, become of a deep brown. The season for gathering the cloves is from October to February. The boughs of the trees are then strongly shaken, or the cloves beaten down with long reeds. Large cloths are spread to receive them, and they are afterwards either dried in the sun or in the smoke of the bamboo cane. The cloves which escape the notice of those who gather them, and are purposely left upon the tree, continue to grow till they are about an inch in thickness; and these falling off, produce new plants, which do not bear in less than eight or nine years. Those which are called *mother cloves* are inferior to the common sort, but are preserved in sugar by the Dutch, and, in long voyages, eaten after their meals, to promote digestion.

The clove, to be in perfection, must be full sized, heavy, oily, and easily broken; of a fine smell, and of a hot aromatic taste, so as almost to burn the throat. It should make the fingers smart when handled, and leave an oily moisture upon them, when pressed. In the East Indies, and in some parts of Europe, it is so much admired as to be thought an indispensable ingredient in almost every dish. As a medicine, cloves are very stimulating, and possess in an eminent degree the general virtues of substances of that class. Their pungency resides in their essential oil, which is specifically heavier than water. The clove-tree is never cultivated in Europe. At Amboyna the Dutch allotted the inhabitants 4000 parcels of land, on each of which they were at first allowed, and about the year 1720 compelled, to plant about 125 trees, amounting in all to 500,000. Each of these trees produces annually, on an average, more than two pounds of cloves; and, consequently, the collective produce must weigh more than a million. The Dutch fraudulently mix what they send to Euro-

pean markets with cloves from which the oil has been distilled. These, though in time they receive from the others a considerable share both of taste and smell, are easily distinguishable by their weaker flavour and lighter colour.

Cloves yield by distillation with water about one seventh part of their weight of volatile oil; 960 parts also gave to Neumann 380 of a nauseous, somewhat astringent, watery extract. The same quantity gave only 300 of excessively fiery alkoholic extract. When the alkoholic extract is freed from the volatile oil by distillation with water, the oil that arises proves mild, and the resin that remains insipid. Its pungency, therefore, seems to depend on the combination of these principles. The Dutch oil of cloves is extremely hot and fiery, and of a reddish brown colour, but it is greatly adulterated, both with fixed oils and resin of cloves; for the genuine oil, when recently distilled, is comparatively mild, and colourless, although it gradually acquires a yellow colour. Being heavier than water, and rising in distillation with some difficulty, it is requisite to use a very low-headed still, and to return the distilled water several times upon the residuum.

The officinal preparations into which this spice enters are: Sp. lavend. comp. *Edin. Lond. Dubl.* Sp. ammon. comp. *Lond.* Confect. arom. *Lond.* Elect. scammon. *Lond. Dubl.* Pil. aloes cum col. *Edin.*

CARYOPHY'LLUM RU'BRUM; the clove pink, CLOVE-GILLIFLOWER, or July-flower. This fragrant plant, is the *dianthus caryophyllus, floribus solitariis, squamis calycinis subovatis brevissimis, corollis crenatis* Linn. Class, *Decandria.* Order, *Digynia.* It grows wild in several parts of England; but the flowers, which are pharmaceutically employed, are usually produced in gardens. They have a pleasant aromatic smell, somewhat allied to that of the clove spice; and their taste is bitterish and subastringent. These flowers were formerly in extensive use, but are now merely employed in the form of syrup, as a useful and pleasant vehicle for other medicines. The titles are: Syr. caryoph. rub. *Lond.* and Syr. dyanthe caryoph. *Edin.*

CARYOPHY'LLUS AROMATICUS; the systematic name of the clove tree. See CARYOPHYLLUM AROMATICUM.

CARYO'TA, in botany, a genus belonging to the natural order of *Palmæ.* The male calyx is common, the corolla tripartite; the stamina very numerous: the female calyx the same; the corolla tripartite; one pistil, and a dispermous berry.

CASARI'NA, in botany, a genus of the monandria order, belonging to the monœcia class of plants. The male has the calyx of the amentum; the corolla a bipartite small scale. The female has a calyx of the amentum, no corolla; the style bipartite.

CASCARI'LLA, (dim. of *cascara,* Span. a general term denoting bark or shell); also called *chocarilla, elutheria,* and *eluteria.* The bark of the *clutia eluteria, foliis cordato-lanceolatis* Linn. Class, *Diœcia,* Order, *Pentandria.* Cascarilla comes to us in quills, covered upon the outside with a rough, whitish matter, and brownish on the inner side, exhibiting, when broken, a smooth, close, blackish brown surface. It has a lightly agreeable smell, and a moderately bitter taste, accompanied with a considerable aromatic warmth. It is a very excellent tonic, astringent, and stomachic, and is deserving of a more general use than it has hitherto met with amongst practitioners.

Dr. Cullen is at a loss whether to class the cascarilla among the aromatics, or as a tonic, but he inclines to the latter. It approaches to the aromatics, he says, by its essential oil; but its bitter, to be extracted by either water or spirit, is its most considerable part.

"It was introduced into practice in the last century as a medicine of great value, both in continued and in intermittent fevers; and the Stahlians, fond of any thing as a substitute for the Peruvian bark, against which they had declared so strongly, received the cascarilla, and employed it much in practice, and have given many testimonies of its efficacy: but these testimonies have not been supported by other practitioners since; and particularly in this country we have found it a very weak substitute for the Peruvian bark. Bergius says of it, 'Ast fatendum illum in ipsis febribus parum facere, neque tertianis vernalibus certo mederi.' Our experience in this country, is suitable to this; and in several trials it has entirely failed. What Bergius adds to the passage quoted, 'Sed in hæmoptysi sæpe prodest,' is not supported by our experience; and, in hæmorrhagies of all kinds, it seems to be rather hurtful, as might be expected from its aromatic and bitter qualities, while it does not in any instance discover an astringent power. It may be allowed to be of tonic and stomachic power; but, even in this way, its virtues are not peculiar nor considerable: and there is no just foundation for the prejudices which professor Stisser and other German physicians have conceived in its favour."

The officinal preparations of cascarilla are: Tinct. *Lond. Dubl.* Extract. *Lond.*

CA'SEUS, (from the Arabic *casah,* milk); cheese. See CHEESE.

CASHEW NUT. See ANACARDIUM OCCIDENTALE.

CASSA'DA, called also *cassava,* and *cassavi;* the *jatropha manihot* Linn. This plant grows in America. See JATROPHA. Its root, which is the part in common use, is called in that country *yuca.* The Mexicans call it *quanticamotli;* and, when it is prepared into meal or flour, they call it *cassavi.*

The names for different preparations of the root, in order to make it into bread, are various.

The stalks and roots of the species all pass under the common name of *mandihoca*. The liquor that is pressed from the plant is called *manipuera;* the root macerated in water till it is soft, *mandiopiba.* Of the sediment of this last is made a finer flour, called *vipeba* by the Brasilians, and by the Portuguese *farinha fresca*, the undried dressed meal *farinha relada.* The soft mandihoca is called *puba;* when dried over the fire, or in the sun, it is called *carima*, and of this good bread is made, which is called *musam*, or *angu*, or *enfonde.*

It is the fourth and fifth species, called *janipha*, and *manihot*, natives of Africa and the West-Indies, which are cultivated as articles of food. The root of the bitter cassada is poisonous when raw; but it may be entirely deprived of the noxious qualities, which reside in the juice, by heat. Cassada bread is made therefore both of the bitter and sweet, by washing and scraping the roots clean, grating them into a tub or trough, and squeezing out the juice by strong pressure through a hair bag: the thinner part of this is evaporated, and the remainder dried over the fire in a hot stone bason, and afterwards made into cakes. It also makes puddings equal to those of millet.

Cassada roots yield a great quantity of starch, called *tapioca,* exported in little lumps by the Brasilians, and now well known to us as diet for sick and weakly persons.

The small bits which have escaped the grater, and the clods not passing through the sieve, are dried in a stove after the flour is roasted; then pounded in a mortar to a fine powder, of which is made soup. It is likewise used for making a kind of coarse cassada, which is roasted till almost burnt. This, fermented with melasses and West-India potatoes, forms an intoxicating liquor, a favourite drink of the natives, who call it *ouycou.* With this the poorer inhabitants and workmen get intoxicated. This liquor is of a red colour, strong, nourishing, and refreshing; and strangers are soon and easily accustomed to drink it as beer.

Of the carima, and also of the tapioca, are made emulsions, ptisans, &c. which are used in consumptions, dysenteries, fevers, &c. The scrapings of fresh bitter cassada are applied to ill-disposed ulcers.

The juice of ROUCOU is said to be an antidote to the poison of this plant.

CASSA'VA. See CASSADA.

CA'SSIA, (κασσια; from the Arabic *katfia*, which is from *katsa*, to tear off; so called from the act of stripping the bark from the tree). There are thirty species, all of them natives of warm climates. The pulp of the cassia fistularis is generally termed cassia. See CASSIA FISTULARIS.

CA'SSIA CARYOPHYLLA'TA; the CLOVE BARK TREE. This tree is the *myrtus caryophyllata; pedunculis trifido-multifloris, foliis obvatis* Linn. Its bark is a warm aromatic, of the smell of all-spice, but weaker, and with a little admixture of the cinnamon flavour. It may be used medicinally with the same views as cloves or cinnamon.

CA'SSIA FI'STULA; the systematic name of the purging Cassia. See CASSIA FISTULARIS.

CA'SSIA FISTULA'RIS; the purging cassia. This is the *cassia fistula* Linn. *cassia foliis quinquejugis ovatis acuminatis glabris, petiolis eglandulatis.* Class, *Decandria.* Order, *Monogynia.* A native of both Indies. The purging cassia of Alexandria rises to the height of forty or fifty feet, with a large trunk, dividing into many branches, garnished with winged leaves, composed of five pair of spear-shaped lobes, which are smooth, having many transverse nerves from the mid-rib to the border. The flowers are produced in long spikes at the end of the branches, each standing upon a pretty long foot-stalk: these are composed, like the former, of fine yellow concave petals, which are succeeded by cylindrical pods from one to two feet long, with a dark brown woody shell, having a longitudinal seam on one side, dividing into many cells by transverse partitions, each containing one or two oval, smooth, compressed seeds, lodged in a blackish pulp, which is the part used in medicine. Till of late years, there were two sorts of this drug kept in the shops; one brought from the East Indies, the other from the West: the canes or pods of the latter are generally large, rough, thick-rinded, and the pulp nauseous; those of the former are less, smoother, the pulp blacker, and of a sweeter taste; this sort is preferred to the other. The pulp of this kind has long been used as a laxative medicine, and being gentle in its operation, and seldom disturbing the bowels, is well adapted to children and pregnant women. The officinal preparation of this drug is, *electuarium è cassia;* it is also an ingredient in the *electuarium è senna.* See SENNA.

CASSIA FLOWERS. What are so called in the shops, are the flowers of the cinnamon tree, or true *laurus cinnamomum* Linn. They possess aromatic and astringent virtues, and may be usefully employed in decoctions, &c. in all cases where cinnamon is recommended as a medicine. See CINNAMOMUM.

CA'SSIA LI'GNEA, or *cortex canellæ Malabaricæ.* Cassia lignea is the bark of the *laurus cassia; foliis triplinerviis lanceolatis* Linn. whose leaves are called folia Malabathri in the shops. Mr. Curtis, in his Catalogue of Medicinal Plants, in the London Botanic Garden, calls it laurus Malabathrum. This bark (the best pieces of which are called daphnitis) resembles cinnamon in appearance, but is distinguishable by its breaking short or smooth, whilst cinnamon breaks fibrous and shivery; also by chewing, after which the cassia becomes mucilaginous, but the cinnamon austere

and dry. It resembles cinnamon in flavour, but is weaker: it contains a mucilage, of which cinnamon does not sensibly partake; if powdered, and boiled in water, the water becomes glutinous, so as to concrete, on cooling, into a jelly. Of the bark, chuse that which is small, purplish, easily broken, fragrant, pungent, sweetish, and mucilaginous, when chewed in the mouth.

Alkohol extracts the aroma, and water extracts the mucilage. By distillation in water, it yields a small portion of oil, which differs not from that of cinnamon; and, if care is taken in distilling it with water, no difference can be discovered from what it produces, and that which is drawn from true cinnamon; but, if too much heat is continued at the end of the operation, it will produce an empyreumatic flavour, because of the mucilage, which is very apt to be changed by the fire. As a cordial, it is equally good as cinnamon, if twice the quantity is allowed for a dose; but its astringent powers are very inferior.

CA'SSIA, PURGING; the cassia fistularis. See Cassia fistularis.

CA'SSIA SENNA; the systematic name of the plant, which, in Alexandria, affords what is termed Alexandrian senna, and in Italy, the senna Italica. See Senna.

CA'SSIDA, (from *cassis*, a hood, or helmet; so called from its likeness); also called *scutellaria*, *tertianaria*, and *lysimachia galericulata;* hooded loose-strife. It was called *tertianaria*, from its use in intermitting fevers. It is bitter, of a fœtid smell like garlic, but is of very little use in modern medicine.

CA'SSINE, or Cassina, a genus in Linnæus's botany, to which he adds the *maurocenia*, or Hottentot cherry tree. It is of the class *Pentandria:* order, *Trigynia:* in the natural method ranking under the 23d order, *Dumosæ.* The calyx is quinquepartite; the petals are five; and the fruit is a trispermous berry. There are three species, all of them natives of warm climates. Of these the most remarkable is the *yapon*, which is a native of the maritime parts of Virginia and Carolina. It rises to the height of ten or twelve feet, sending out branches from the ground upward, garnished with spear-shaped leaves placed alternately, which continue green through the year. The flowers are produced in close whorls round the branches, at the foot-stalks of the leaves; they are white, and divided into five parts, almost to the bottom. The berries are of a beautiful red colour; and, as they continue most part of the winter upon the plants without being touched by the birds, we may reasonably conclude that they are possessed of a poisonous quality; as few of the wholesome innocent fruits escape their depredations. The Indians, however, have a great opinion of this plant as an emetic, and at certain seasons of the year come in great numbers to fetch away the leaves. The Spaniards also, who live near the gold mines of Peru, are frequently obliged to drink an infusion of this herb, in order to counteract a sort of suffocation to which they are liable from the strong metallic exhalations that are continually proceeding from the mines. In Paraguay, the Jesuits make a great revenue by importing the leaves of this plant into many countries, under the name of Paraguay or South-sea tea, which is there drunk in the same manner as that of China or Japan is with us. It is with difficulty preserved in England.

CASSUMMU'NIAR, called also *casmunar*, or *casumunar.* The root of this, brought from the East Indies, is tuberous, an inch or more thick, marked on the surface with circles or joints like the galangal, a species of which it is reckoned by some: it is brown on the outside, and of a dusky yellow within. We have no certain account of the plant from which this root is taken; it is brought over in irregular slices. Cassumuniar was extolled by Marloe as a medicine of uncommon efficacy in nervous diseases; at present it is used as a stomachic, but its use is not so general as it seems to deserve. It is warm and aromatic, slightly bitter, in smell resembling ginger, or zedoary, from which it differs in being milder. Alkohol extracts all its virtue completely; and if the tincture be evaporated, it all remains in the extract.

CAST, a term denoting a figure, which, being originally composed of soft or fluid materials, owes its inequality or uniformity of shape, to the compression or confinement of its parts in a mould previously constructed for that end. The mode of preserving representations of morbid parts, or other anatomical phenomena, by casts in plaster of Paris, wax, &c. afterwards accurately coloured, is excellent. These make the most conspicuous figure in our anatomical cabinets, and may truly be said to approach more nearly to the things for which they are substitutes, than any other sort of preparation. See Preparations.

Anatomical casts are most commonly made of plaster of Paris, which is alabaster calcined by a gentle heat. The advantage of using this substance preferably to others is, that notwithstanding a slight calcination reduces it to a pulverine state, it becomes again a tenacious and cohering body, on being moistened with water and afterwards suffered to dry; by which means either a concave or a convex figure may be given (by a proper mould or model) to it, when wet, and retained by the hardness it acquires when dry: and from these qualities, it is fitted for the double purpose of making both casts, and moulds for forming those casts. The particular manner of making casts depends on the form of the subject to be taken. Where there are no projecting parts, as in medals, it is very simple and easy; as likewise where there are such as form

only a right or any greater angle with the principal surface of the body: but where parts project in lesser angles, or form a curve inclined towards the principal surface of the body, the work is more difficult.

The first step to be taken is the forming the mould. In order to this, if the original be a bas-relief, or any other piece of a flat form, having its surface first well oiled, or greased, it must be placed on a table, and surrounded by a frame, the sides of which must be at such a distance from it as will allow a proper thickness for the sides of the mould. As much plaster as will be sufficient to cover and rise to such a thickness as may give sufficient strength to the mould, as also to fill the hollow betwixt the frame and the model, must be moistened with water, till it be just of such consistence as will allow it to be poured upon the model. This must be done as soon as possible; or otherwise the plaster will concrete or set, so as to become unfit to be used. The whole must then be suffered to remain in this condition, till the plaster has attained its hardness; and then the frame being taken away, the preparatory cast or mould, thus formed, may be taken off from the subject entire, and afterwards left to dry.

But where the model or origiual subject is of a round or erect form, a different method must be pursued; for the mould must be formed in several pieces: or if the subject consists of detached and projecting parts, it is frequently most expedient to cast such parts separately, and afterwards join them together. Where the subject forms a round, or spheroid, or any part of such round or spheroid, more than one half the plaster must be used without any frame to keep it round the model; and must be tempered with water to such a consistence, that it may be wrought with the hand like very soft paste; but though it need not be so fluid as when prepared for flat figured models, it must yet be as moist as is compatible with its cohering sufficiently to hold together; and being thus prepared, it must be put upon the model, and compressed with the hand, or any flat instrument, that the parts of it may adapt themselves, in the most perfect manner, to those of the subject, as well as be compact with respect to themselves. When the model is so covered to a convenient thickness, the whole must be left at rest till the plaster be set and firm, so as to bear dividing without falling to pieces, or being liable to be put out of its form by slight violence; and it must then be divided into pieces, in order to its being taken off from the model, by cutting it with a knife with a very thin blade; and being divided, must be cautiously taken off, and kept till dry: but it must be always carefully observed, before the separation of the parts be made, to notch them across the joints or lines of the division, at proper distances, that they may with ease and certainty be properly conjoined again; which would be much more precarious and troublesome without such directive marks. The art of properly dividing the moulds, in order to make them separate from the model, requires more dexterity and skill than any other thing, and does not admit of rules for the most advantageous conduct of it in every case. Where the subject is of a round or spheroidal form, it is best to divide the mould into three parts, which will then easily come off from the model; and the same will hold good of a cylinder or any regularly curved figure.

The mould being thus formed, and dry, and the parts put together, it must be first greased, and placed in such a position that the hollow may lie upwards, and then filled with plaster mixed with water, in the same proportion and manner as was directed for the casting the mould: and when the cast is perfectly set and dry, it must be taken out of the mould, and repaired where it is necessary; which finishes the operation.

Where the model forms curves which intersect each other, the conduct of the operation must be varied with respect to the manner of taking the cast. But in fact it must be left to the good sense of the operator to judge, from the original subjects, what parts will come off together, and what require to be separated. The principle of the whole consists only in this, that where under-workings, as they are called, occur, that is, wherever a straight line drawn from the basis or insertion of any projection would be cut or crossed by any part of such projection, such part cannot be taken off without a division; which must be made either in the place where the projection would cross the straight line; or, as that is frequently difficult, the whole projection must be separated from the main body, and divided also lengthwise into two parts: and where there are no projections from the principal surfaces, but the body is so formed as to render the surface a composition of such curves, that a straight line being drawn parallel to the surface of one part would be cut by the outline, in one or more places, of another part, a division of the whole should be made, so as to reduce the parts of it into regular curves, which must then be treated as such. A tolerably good general rule with some, is to apply the plaster only to so much of the surface of the model as the eye can distinctly see.

In larger masses, where there would otherwise be a great thickness of the plaster, a *corps* or body may be put within the mould, in order to produce a hollow in the cast: which both saves plaster, and renders the cast lighter. This corps may be of wood, where the forming a hollow of a straight figure, or a conical one with the basis outward, will answer the end: but if the cavity require to be round, or of any curved figure, the corps cannot be then drawn while entire; and consequently

should be of such matter as may be taken out piece-meal. In this case, the corps is best formed of clay; which must be worked upon wires to give it tenacity, and suspended in the hollow of the mould, by cross wires lying over the mouth; and when the plaster is sufficiently set to bear handling, the clay must be picked out by a proper instrument. Where it is desired to render the plaster harder, the water with which it is tempered should be mixed with glue size, which will make it very firm and tenacious.

After a cast has been accurately made, it is of the utmost importance that it should be accurately coloured, and this should be done before the subject has had time to undergo any change from drying or putrefaction. To do this properly an experienced limner must be employed, for it is not the work of a mere colourist; every tint, line, and appearance, however slight, must be represented; and when the colours are perfectly dry the surface must have a coat of copal or other varnish, which will preserve it from injury.

CASTA'NEA, (καςανον; from *Castana*, a city in Thessaly, from whence they were first brought); the common CHESNUT. The fruit of this plant, *fagus castanea; foliis lanceolatis, acuminato-serratis, subtus nudis*, Linn. are much esteemed as an article of luxury, after dinner. Roasting renders them more easy of digestion; but, notwithstanding, they must be considered as improper for dyspeptic stomachs. They are moderately nourishing, as containing sugar and much farinaceous substance.

CASTING, a term sometimes used for the quitting, or throwing aside any thing from the body of an animal, by an effort of nature. Thus deer cast their horns, snakes their skins, lobsters their shells, hawks their feathers, &c. annually. When birds cast their *feathers* it is more commonly called *moulting* or *mewing*. A horse *casts* his hair, or coat, at least once a year, viz. in the spring, when he casts his winter coat; and sometimes, at the close of autumn, he casts his summer coat, in case he has been ill kept. Horses also sometimes *cast* their hoofs, which happens frequently to coach horses brought from Holland. These being bred in a moist marshy country, have their hoofs too soft; so that when brought to a drier soil, and less juicy provender, their hoofs fall off, and others that are firmer succeed. The term *casting a colt*, denotes a mare's proving abortive.

CASTLE-LEOD WATER. This mineral water is found at a town from whence it takes its name in Rossshire, in Scotland; and here there is a spring of strong sulphureous water, which has been in great repute for many years. Dr. Monro, from an analysis he made of these waters, says, that a gallon contains about 59 grains of solid matter; viz. of absorbent earth, $1\frac{4}{5}$ grains; of selenites, $26\frac{4}{5}$ grains; of saline matter, $30\frac{2}{5}$ grains; the greatest part of which is true Glauber's salt, mixed with a pittance of sulphur, and probably with a very small portion of marine bittern. This water is said very sensibly to increase the urine, and sometimes remarkably open the pores. It whets the appetite, and sits light on the stomach; some have the head-ach after drinking their morning bottle, but it is of no long duration, nor to any great degree. Dr. Mackenzie has directed people with various complaints to drink them, and observes that some very foul faces have been cleared by their use, the herpes removed, the erysipelas received benefit, foul ulcers cured, &c. Dr. Monro asserts, that many of those cutaneous disorders called scorbutic have been removed by their means, and that they cure the itch. As this water contains but a small portion of purging salt, and does not operate by stool, some purging salt, may be occasionally added to the first glass that is taken in the morning; and if equal parts of this and sea-water be mixed, they will form a purging sulphureous water, similar to that of Harrowgate.

CA'STOR. See CASTOREUM.

CASTOR OIL; *Oleum ricini*. See RICINUS.

CASTOR, RUSSIAN. See CASTOREUM.

CASTO'REUM, (*castor*, quasi γαστωρ, from γαστηρ, *the belly*, because of the largeness of his belly; or from *castrando*, because he is said to bite off his testicles in order to escape the hunters), CASTOR; a substance procured from the beaver: the *castor fiber*, or *castor cauda ovata plana, calva*, Linn. Systema Naturæ. The beaver is an amphibious quadruped, inhabiting some parts of Prussia, Poland, Russia, and Germany; but the greatest number of these animals is met with in Canada. In the inguinal region of the beaver are found four bags, of an oval shape, a large and a small one on each side; in the two large ones is contained a softish, greyish yellow, or light brown substance, which in a warm dry air grows by degrees hard and brittle, and of a darker and browner colour: this is the substance called *castor*, and is what is used in medicine. The two smaller bags have a smell much like that of the larger, but contain a softer and more unctuous kind of matter, which is not of much value.

On cutting these bags, when dry, and as found in the shops, they appear full of a brittle friable substance, of a brownish red colour, interspersed with fine membranes and fibres, exquisitely interwoven. Neumann says, that the best comes from Prussia; but most, if not all other writers, say from Russia: the last is in hard round bags. An inferior sort comes from Dantzic: it is smaller and moister. The worst is from New England; in thin long cods. It is easy to distinguish the Russian *castor*, which has a strong, but not agreeable smell; whilst the other sorts are weaker and more insipid.

Rondeletius seems to have been the first who made the distinction between these bags or glands of the *beaver*, and his testicles, which latter they were generally said to be. From whatever country it comes, we should chuse that which is got from a full grown beaver; having a fœtid and disagreeable smell, an acrid biting taste, a brownish colour, and a friable texture. It is adulterated with dried blood, gum ammoniacum, galbanum, &c. mixed with a little of the powder of *castor* and some quantity of the fat of the beaver. But to detect this fraud, we should observe, that the genuine follicules arise both from one common source; that the matter contained in them is of a firm consistence, and too bulky to be introduced by force in their natural state. Neither is the smell so strong as that of the genuine kind: nevertheless it is true, that sometimes the difficulty to distinguish the false from the genuine is very great. The sophistication, however, is undoubted, when the membranes, pellicles, and fibres appear intermixed with the *castor*.

This drug does not keep well in powder. Alkohol, proof spirit, and water, by the help of a little heat, extract the whole of its virtue. Neumann got from 480 parts of castor 140 of alkoholic extract, and afterwards 80 watery; and inversely, 140 of watery, and 20 of alkoholic. The first alkoholic extract retained the whole flavour of the castor, as none of it rose in distillation with the alkohol. The distilled water, on the contrary, contained the whole flavour, and the watery extract was merely bitter. Cartheuser obtained from it a volatile oil by distillation.

Castor is reckoned an excellent antispasmodic. See Antispasmodica. Dr. Andrew Duncan says, it is very little heating, and acts particularly upon the uterine system. It is accordingly given with advantage. 1. In typhoid fevers. 2. In spasmodic diseases, especially in hysteria and epilepsy, and in cases of difficult parturition, from a spasmodic contraction of the mouth of the uterus after the membranes have burst. 3. In amenorrhœa. It is exhibited most advantageously in the form of recent powder, in doses of from 10 to 20 grains, and in clysters to the extent of a drachm. Diluted alkohol extracts its virtues, forming a convenient tincture, as directed both by the London, Edinburgh, and Dublin Pharmacopœias; but its exhibition in the form of extract or decoction is improper.

CASTRATION, the operation of cutting off the testicles. To speak of it generally, this is much in use in Asia, especially among the Turks, who practise it on their slaves, to prevent any commerce with their women; and in doing it, they often make a general amputation. Castration also obtains in Italy, where it is used with a view to preserve the voice for singing. See Eunuch. The Persians, and other eastern nations, differ in their methods of making eunuchs. Castration was for some time the punishment of adultery; and by the laws of the Visigoths, sodomites underwent the same punishment. By the civil law of England, it is made penal in physicians and surgeons to castrate, even with consent of the party, who is himself included in the penalty, and his effects forfeited. This operation is never performed, amongst us, but for the removal of testicles that are diseased; in which case, the life of the person castrated can only be preserved by that means. The disease which most frequently demands it is the *scirrhous testicle* or *sarcocele*. See Sarcocele.

When this operation becomes absolutely necessary, and is in all respects advisable, the method of doing it may be this:—The hair growing on the parts being previously shaved, the patient is to be laid upon a square table of about three feet four inches high, letting his legs hang down: which, as well as the rest of his body, must be held firm by assistants; or he may be laid across a bed in the same manner. Next, with a knife, the incision is to be begun above the rings of the abdominal muscles, that there may be room afterwards to secure the vessels: then carrying it through the membrana adiposa, it must be continued downward to the bottom of the scrotum. A firm, waxed, flat ligature, composed of small threads, is next, by means of a curved needle, to be passed round the spermatic cord, at least an inch above the diseased part, or as near the abdominal ring as possible; after which the vessels are to be secured by a running knot, and divided about a quarter or half an inch below the ligature. The cord and testicle are then to be removed from the surrounding parts by dissecting from above downwards, and no instrument is better for this purpose than the common scalpel. After the diseased parts are removed, the knot upon the cord must be slackened to discover the spermatic arteries and veins; both of which, by means of the tenaculum or a common forceps, are to be taken up. The ligature upon the spermatic cord is now to be left loose, so as to act as a tourniquet if a hemorrhagy should ensue; nor is there more occasion for leaving the ligature tied than for leaving a tourniquet firmly applied to one of the extremities after amputation: in fact, where patients have suffered such pain as is sometimes mentioned by authors, it has been found to be owing to the tightness of the ligature rather than to any other cause. In dividing the ligatures of the blood-vessels at the extremities of the cord, they must be left at such a length, without the wound, as to be readily removed, however much the cord may retract in the time of the cure.

In separating the testicle, a considerable hemorrhage sometimes ensues from the division of the scrotal arteries. In such a case, they ought always to be fixed with ligatures before proceeding in the

operation. The parts being removed, and the blood-vessels secured, the wound is to be cured, if possible, by the first intention; and for this purpose the sides of the scrotum are to be brought together in the most accurate manner, beginning at the under end, and securing the parts by adhesive plaster as we proceed upwards, and in such a way that the sides of the sore may be kept properly together. About two inches of the ligatures on the cord are to be left out, and this part of the wound treated in the same manner as the rest; the whole to be secured by a compress of linen and a T bandage. See BANDAGE.

With regard to the subsequent treatment, the patient should now be laid to rest, and an opiate administered; and if, upon the second or third day, any inflammatory symptoms ensue, they are to be removed by methods commonly employed upon these occasions; as, topical blood-letting, gentle laxatives, and keeping the part constantly moist with a solution of vitriolated zinc. The dressings ought not to be allowed to shift, else the cure will be greatly retarded. They are to be examined about four or five days after the operation; and if nothing material has happened, they may be allowed to remain two or three days longer, by which time generally the ligature can be readily removed; and the wound will be healed by the first intention, excepting some small opening in the skin, more especially where the ligatures were placed. These are to be drawn together by adhesive straps, and dressed in the same manner as formerly. In this way, if the patient be otherwise healthy, a cure may be expected in little more than a fortnight.

The method of dressing most frequently practised is to apply a quantity of soft lint to the sore, and then a compress of linen over it, and to secure the whole with a T bandage or a suspensory bag. But whatever course may be taken in this respect, the sore is not to be touched till a free suppuration takes place, which will commonly be about the fifth or sixth day, and then the dressings should be removed and renewed from time to time; once every two days or oftener, as the quantity of matter may render it necessary. Sometimes, after the operation, the patient complains of pain in the sore, and of tension and uneasiness in the belly. In such a case, warm fomentations should be applied to the abdomen, and the sore covered with an emollient poultice, and this repeated as often as may be necessary.

Mr. Gooch, in Vol. II. of his cases, recommends a method of castration different from the foregoing; it is this:—He first slits the sheath of the cord with the point of a knife, then opens it farther with a small pair of crooked scissars, by which method the vessel is fairly discovered, and easily taken up with a crooked needle and ligature. And he farther observes, that if the whole spermatic cord is tied, the consequences are disagreeble, or perhaps fatal: he therefore, after dissecting the sheath, secures only the artery, and thus an hæmorrhage is prevented, and the occasional consequences of *tying the whole cord* avoided. Dr. Hunter long since advised to secure the artery, and leave the rest of the cord; nay, he suggests the idea of a sufficient security from fatal consequences even though the artery should be left untied. Still if it is to be cut close to the ring, he advises to tie it before cutting, that it may not retract too suddenly, and so prove troublesome by its discharge.

CASTRATION, in botany, a term derived from the fancied analogy betwixt plants and animals. The castration of plants consists in cutting off the *antheræ*, or tops of the stamina, before they have attained maturity, and dispersed the pollen or fine dust contained within their substance. This operation has been frequently practised by modern philosophers, with a view to establish or confute the doctrine of the sexes of plants; the antheræ or tops being considered by the sexualists as the male organs of generation. The experiment of castration succeeds principally on plants which, like the melon, have their male flowers detached from the female. In such as have both male and female flowers contained within the same covers, this operation cannot easily be performed without endangering the neighbouring organs.

CAT-MINT. See NEPETA.

CAT-SALT, a name given by the salt-workers to a very beautifully granulated kind of common salt. It is formed out of the bittern, or leach brine, which runs from the salt when taken out of the pan. When they draw out the common salt from the boiling pans, they put it into long wooden troughs, with holes bored at the bottom for the brine to drain out; under these troughs are placed vessels to receive this brine, and across them, small sticks, to which the cat-salt affixes itself in very large and beautiful crystals. This salt contains some portion of the bitter purging salt, is very sharp and pungent, and is white when powdered, though pellucid in the mass. It is used by some for the table, but the greatest part is employed by the hard-soap makers.

CAT'S-EYE, the SUN-STONE of the Turks, a kind of gem found chiefly in Siberia. By the Latins it is called *oculus cati*, and sometimes ONYCOPALUS, as having white zones or rings like the onyx; and its colours variable like OPAL, from which last it differs chiefly by its superior hardness. It is very hard, and semitransparent, and has different points, from whence the light is reflected with a kind of yellowish radiation somewhat similar to the eye of a cat, from whence it

had its name. The best specimens are very scarce. One of them, an inch in diameter, was in the cabinet of the late Grand Duke of Tuscany.

CATALEPSIS, (from καταλαμβανω, *to hold, seize*, or *interrupt); the* CATALEPSY. It is also called *catoche*, *catochus*, &c.; and by Hippocrates, *aphonia;* by Antigenes, *anaudia;* by Cœlius Aurelianus, *apprehensio*, *oppressio*; and also by some late writers *apoplexia cataleptica.*

This disease is ranked by some under the list of acute ones; and indeed, with the carus, it may be ranked among the species of apoplexy. Dr. Cullen also ranks it as a species of apoplexy, to which he affixes the following remark: "I never saw any catalepsy, but what was counterfeited; and the same has been seen by others. Therefore, from the disease being seldom seen, differently described, and often altogether feigned, I know not in what place to fix it with certainty; but as I am persuaded, in general it does not differ from apoplexy, I have, therefore, placed it under that head," viz. *apoplexia cataleptica*, when the muscles are found to be contracted upon any attempt to move them by external force.

The immediate cause seems to be an impediment to the functions of the nerves subservient to voluntary motion. The remote causes are the same as those that produce other nervous affections; such as poor diet, a cold and moist atmosphere, fear, anger, anxiety, and other debilitating passions of the mind; intense thought, excesses of any kind, worms, &c.

This disorder very rarely occurs: when it does, the fits seize the patient at intervals, and last generally a few minutes, though now and then they continue for some hours or days. It is rarely preceded by any signs that indicate its approach; in a few instances a stiffness in the neck, a dull pain in the head, &c. have ushered in the fit. In the disorder the patient is apparently senseless and motionless; continuing in the posture in which the fit attacked him, until he recovers from it. The limbs are moveable by another person; but, however they are disposed, the patient never alters their position, until the paroxysm is at an end. He neither sees, hears, nor feels the methods that may be used to excite his sensations. He swallows greedily all that is given him; his countenance becomes florid; his eyes, which are open, seem fixed upon some object; at the close of the fit he fetches a deep sigh, and then recovers. Other symptoms also attend different patients, or the same persons at different times, such as tears dropping from the eyes, grinding of the teeth, &c. but the above are the symptoms most generally attendant. Care must be taken not to confound a *catalepsy* with a tetanus. See TETANUS.

In general the cure will be similar to that of the apoplexy. See APOPLEXIA. The indication, in the fit, is to relax the spasmodic stricture; and, out of the fit, to remove the material, or secondary causes, which contribute to the production of the constriction. In the fit apply pungent remedies, such as the concentrated acid of vinegar, volatile alkali, &c. to the nose. Forestus strongly recommends topical anti-spasmodics on the nape of the neck, and on the back part of the head, after shaving it. Of these, the oil of amber with volatile spirits, are deemed preferable. Strong stimulating clysters may be injected, if the anus is not too much constricted to admit them. Bleeding is to be recommended, if the face be very red and the veins turgid; but the strength of the patient and the state of his pulse, will best determine the propriety of this operation. Blisters, though often employed in these cases, seem not so eligible an application as sinapisms to the feet. Two or three spoonfuls of the following, may be given, at proper intervals:

℞ Gum. assafœtid. ʒij.
Aq. puleg. ℥iv.
Sp. ammoniæ fœtid.
Tinct. valer. vol. āā ℥ss. Misce.

Dr. Hugh Smith, without making any remarks on the disease, gives us the following formulæ:

℞ Pulv. rad. ipecacuanhæ, ℈ss.
Antim. tartar. gr. iij.
Misce fiat pulv. emetic. cum regimine sumend.

Or,

℞ Cupri vitriolat. gr. ij.
Aq. fontan. ℥ij.
Syr. simp. ʒj.
Misce fiat haust. emetic. mane sumendus.
Applicetur epispastic. spinæ dorsi.

℞ Sem. sinap. trit.
Rad. raphan. rust. contus. aa. ℥ss.
Aceti, q. s.
Fiat cataplasm. plant. ped. applicand.

R Gum. assafœtid. ʒj. solve in
Aq. cinnam. ten. ℥vij. Adde
Tinct. valer. vol. ℥j.
Misce capiat coch. ij. tertia quaque hora.

The following singular case of catalepsy, appears in a volume of medical miscellanies, published many years since, by a Society of gentlemen in London. It was written in Latin by M. Gaultier, a French physician, resident in Berlin, and published some time afterwards, with observations, by the academician M. Formey.

The widow of the Sieur Vignoles, a French refugee, at Berlin, had been afflicted for twenty-five

years with a kind of periodical catalepsy, of which she had two returns every day, one at day-break, or at least before sun-rise, the other about noon. It was much the same at all seasons of the year, insomuch that the paroxysm began sooner or later, according to the length or shortness of the days. At the periods of attack she dropped into the most profound sleep, accompanied with an entire privation of all feeling both external and internal, and the transition was so sudden, that it was difficult to observe it. Her limbs became perfectly rigid, and continued precisely in the same situation in which they were at the instants when the paroxysms came on. Her pulse was small, but equal; and her respiration, though weak, was also free as in the most natural sleep. Pulling, shaking, even cuppings and deep scarifications, could not remove, in the smallest degree, the lethargy, nor produce the slightest mark of sensibility.

Twice a-day, that is to say, towards noon, and between seven and eight in the evening, this strange sleep went off of itself; but the first recovery was not complete; the inferior parts still remained stiff and deprived of feeling, and the interval was, besides, so short, that the patient had scarcely time to swallow a little broth, before the fit returned. In the evening she awoke entirely; all the parts of her body, the inferior as well as the superior, recovered their flexibility and their feeling, so that the patient could rise and walk about in her chamber as long as she pleased.

The relaxation continued from eight o'clock in the evening to the dawning of the next day, which never failed to bring on the sleep again, and every day these astonishing alternatives were renewed with the most punctual regularity.

Her partial recovery about noon was preceded by quivering, and afterwards violent agitations in the lower jaw, convulsive motions in the fingers, thumbs, lips, and eye-lids; the head, if inclined, resumed its natural position; the patient raised herself up, seemed to groan, and uttered inarticulate sounds. She then rubbed her hands together, at length opened her eyes, observed the spectators, and began to talk rationally. These, and other analogous circumstances, usually took up about half an hour. The termination of each of these attacks was infallibly announced, two or three days before it happened, by a copious flow of acrid saliva which excoriated the parts over which it flowed.

Sometimes the fits of this disease continued six months; at others, a year; and one, which commenced soon after the death of her husband, lasted two years and a half. The intervals of relief corresponded usually with the duration of the preceding access: in these the disease disappeared entirely; the patient enjoyed good health, and could attend to domestic concerns without pain or inconvenience.

This lady, in the early part of her life, had been subject to hysterical complaints, accompanied with convulsive motions so violent as to prove exceedingly distressing: at the age of twenty-four years she married, and had many children of both sexes, none of whom ever experienced the mother's disorder.

Almost all the physicians of Europe were consulted about this case; no benefit however was derived from their various prescriptions. The precise time when the disease ceased is not known, but she died of a dropsy at the age of eighty, and there did not appear to be the smallest analogy between her last illness and her preceding situation.

Electricity seems to be adapted to a disease of this nature; since there is no known agent so powerful as the electric fluid in stimulating the nerves and recovering the healthy actions of muscles. In one case of catalepsy this powerful remedy was effectually applied: it is very succinctly related by the Abbe Bertholon: "On a gueri par-là," says he, speaking of electricity, "en 1782, une femme sujette à la catalepsie, qui, dans un des ses accès, resta plus de *trente jours* dans un état *d'immobilité parfaite*, sans boire ni manger." The following observation of De Haen, also seems corroborative of the idea that electricity is adapted to the removal of lethargic complaints. "Benedictus Eringer vertigine et somnolentia corripitur: vix decem ictus sustinuerat, quin curatum se diceret, perfectissimeque curatus manet hucusque."

Other cases of catalepsy may be found in the Edinburgh Practice of Medicine, &c. Vol. II. also in the Journal des Savans, Jan. 1776; ed. Amster. p. 232.—Histoire de l'Acad. des Scienc. de Paris, 1738, et Mem. 1742. Col. Acad. Part. Etr. t. III. p. 432, et tom. VII. p. 271. Encyclop. Franc. Art. *Assaupissement.*

CATA'LPA, a species of Bignonia.

CATA'LYSIS, (καταλυσις, from καλαλυω, *to dissolve*, or *destroy).* In the old writers this signifies a palsy, or such a resolution as happens before the death of the patient; also, that dissolution which constitutes death.

CATAME'NIA, (κaλaμηνια, from κaλa, *according to*, and μην, *the month)* the *Menses;* a monthly discharge of blood from the uterus of females, between the ages of sixteen and fifty. See Menses.

CATANA'NCHE, candy lion's-foot, a genus in Linnæus's botany. He enumerates three species.

CATAPA'SMA, (καταπασμα, from καταπασσω, *to sprinkle).* The ancient Greek physicians meant by this, any dry medicine reduced to powder, to be sprinkled on the body. Their various uses are described by Paulus, lib. vii. cap. xiii.

CATA'PHORA, (*καταφορα, to render sleepy)*; the *coma somnolentum* of authors. Dr. Cullen considers it as a lesser degree of apoplexy. See Apoplexia.

CATA'PHORA CO'MA. See Apoplexia Sanguinea.

CATA'PHORA HYDROCEPHA'LICA. See Apoplexia Serosa.

CATAPHI'SMA, a kind of thick poultice of meal and herbs.

CATAPLA'SMA, (from *καταπλασσω, illino, to spread like a plaster)*; a cataplasm, or poultice. See Poultice. *Cataplasms* take their names either from the part to which they are applied, or from the effects they are calculated to produce. The ancients called this composition *anacollema*, or *frontale*, when laid upon the fore-head; and *epicarpium*, or *pericarpium*, when applied to the wrists. *Epispasticum* is the term when these external remedies only redden the skin; *vesicatorium*, when it occasioned blistering; and *sinapisma*, when mustard entered the composition, because it produced irritation and occasioned redness, heat, itching, and tumor, in the part to which it was applied. See Epispastica.

Cataplasms are generally made softer than plasters, and harder than ointments. With us they are commonly formed of some vegetable substances; and applied of such a consistence as neither to adhere nor run. They are also more useful when the intention is effected by the perpetuity of the heat, or cold, which they communicate, for they retain these properties longer than any other kind of external composition. That class of topical remedies formerly called *epithems* are also a kind of *cataplasms*.

Besides the Cataplasms of Alum, Bryony, Charcoal, Cummin, Carrot, Galbanum, and Mustard, (for which see the articles Alumen, Bryonia, Carbo ligni, Cuminum, Daucus, and Sinapism), the following appear in the Pharmacopœia Chirurgica:

Cataplasma Calcis.

℞ Calcis.
Farinæ avenæ sing. unc. ij.
Adipis suillæ præparatæ unc. iv.

The lime is first slacked with a sufficient quantity of water, and the lard and oatmeal are afterwards added. This is said to be in use at the Bath Hospital as a remedy in white swellings.

Cataplasma Calcis Vitriolatæ.

The powdered plaster of Paris is mixed, in the common way, with water, and applied, while soft, to the ulcer; where it hardens and is suffered to remain for two or three days before it is renewed.

Mr. Everard Home says, "Plaster of Paris, [in the state of *powder*] is an application I was led to make use of several years ago, from an idea that it would absorb the matter of a superficial sore as fast as it was secreted, and *form a crust*, which, similar to *a scab*, would induce the parts underneath to skin over; experience, however, proves that this is not the case; and the edges of the sore, in many instances, were much irritated by this application." Whether there be any other mode of employing plaster of Paris to anomalous ulcers, by which their healing may be promoted, can only be determined by farther trials.

Cataplasma Cerevisiæ.

Beer poultice is prepared by stirring into the grounds of strong beer, as much oatmeal as will make it of a suitable consistence.

It is sometimes employed as a stimulant, but most commonly as an antiseptic to parts in a state of gangrene.

Cataplasma Cicutæ.

This is made by adding to the *fomentum cicutæ*, as much oatmeal and linseed flour as will sufficiently thicken it.

This poultice is applied to cancerous and scrofulous ulcers, and to various other sores of an inveterate character, to diminish their sensibility and amend the discharge. See Cancer.

Cataplasma Kali Acetati.

℞ Kali acetati unc. j.
Aquæ distillatæ unc. xx.
Micæ panis q. s. Misce.

A cataplasm consisting of these ingredients, is found to be a useful application to cancerous and ill-conditioned sores. Common vinegar, saturated with kali, and afterwards formed into a cataplasm with bread, is employed by Mr. Nayler, at the Glocester Infirmary, under the name of *cataplasma neutrale*.

Cataplasma Mali maturi.

℞ Mali maturi,
Micæ panis, sing. unc. ij.
Florum rosarum damaseenarum,
Florum sambuci, sing. pug. j.
Camphoræ gran. viij.
Cerussæ acetatæ gran. iv.

To these must be added a sufficient quantity of boiling water to make the whole perfectly soft; and care also taken, by previously rubbing them together with a little mucilage, to distribute equally through the whole mass, the two last ingredients.

This is a formula of the celebrated De Haen; but it is scarcely more efficacious in cases of ophthalmia, for which it is designed, than the simple pulp of a roasted apple applied to the eye as a poultice.

Cataplasma Natri Vitriolati.

℞ Natri vitriolati unc. j
Aquæ ferventis lib. ss
Micæ panis q. s. Misce.

This formula is attributed to Dr. Kirkland, and is said to be particularly useful in *xerophthalmia*, or that kind of inflammation of the eye where the secretions are deficient.

Cataplasma Foliorum Oxalis.

This has been found serviceable in the treatment of ulcers of the scrofulous kind, and even for tumors of the same description. Mr. Sandford, a surgeon at Worcester, applies the bruised leaves alone, if the skin is unbroken, and the part capable of bearing the stimulus. In other cases he orders them to be formed into a soft poultice with oatmeal and small beer; regulating the quantity according to the irritability of the part affected. The herb called *meadow-sweet*, and also meadow-sorrel *root*, are said to have been employed with advantage, in similar cases.

Cataplasma Quercus Marini.

This consists of a quantity of the marine plant commonly called *sea-tang*, which is bruised in a mortar, and afterwards applied, by way of a poultice, in cases of scrofula; white swellings and glandular tumors more especially. Where this vegetable could not be obtained in a recent state, a common poultice of sea-water and oatmeal was substituted by the late Mr. Hunter.

Cataplasma Solani Tuberosi.

A quantity of raw potatoes are to be grated, or pounded in a mortar, to a proper degree of fineness.

This, though a vulgar remedy, is very useful to parts that have been scalded or burnt. The pulp is to be applied cold.

Cataplasma Rosæ.

℞ Conservæ rosæ unc. ij.
Aluminis drach. ss.

The alum is to be finely pulverized and mixed with the conserve.

This cataplasm is reckoned a useful application in the latter stages of ophthalmia, where the parts require to be treated with astringent remedies.

CATAPLE'XIS, (*καταπληξις* from *πλησσω*, *to strike)*; any sudden deprivation of sensation in any of the members or organs of the body.

CATA'POSIS, (*καταποσις* from *καταπινω*, *to swallow down)*; a term which, according to Aretæus, signifies the instruments of deglutition. Hence also the term,

CATAPO'TIUM, (*καταποτιον*); a pill.

CATAPSY'XIS, (*καταψυξις*, from *ψυχω*, *to refrigerate)*; a sense of refrigeration without shivering, either universally felt, or, in some particular part. It is a chilliness, or, as Vogel defines it, an uneasy sense of cold in a muscular or cutaneous part.

CATAPTO'SIS, (*καταπτωσις*, from *καταπιπτω*, *to fall down)*; a term that implies such a falling down, as happens in apoplexies; or, the spontaneous falling down of a paralytic limb.

CATAPU'TIA, (*καταπυτια*, from *καταπυθω*, *to have an ill savour;* or from the Italian *cacapuzza*, which has the same meaning), SPURGE; a plant named as above from its fœtid smell.

CATAPU'TIA MA'JOR. See RICINUS.

CATAPU'TIA MI'NOR. The plant so called in the pharmacopœias, is the *Euphorbia lathyris; umbella quadrifida, dichotoma, foliis oppositis integerimis*, of Linnæus. The seeds are found to possess purgative properties; but if they are exhibited in an over dose, they prove drastic and poisonous; this quality being peculiar to all the *euphorbiæ*.

CATARACT, (*καταρακτα*, from *καταρασσω*, *to confound or disturb;* because the sense of vision is confounded, if not destroyed by it). See CALIGO.

The ancients, and even some writers among the moderns, entertained various opinions concerning the nature and seat of this disease. By some it was supposed to be a distemper of the vitreous humour; by others of the aqueous: by some it was conjectured to be a condensation of earthy particles; and by others a membranous film. Some have imagined it to be situated anterior, and others posterior to the pupil. It was often confounded with the gutta serena, and sometimes even with the opacity of the cornea. At length, however, it is ascertained to be a disorder of the crystalline humour; to be in general absolutely confined to it or

its capsule, and to be attended with a greater or less degree of opacity.

Mr. Pott observes, that from the knowledge of the seat, and of one of the principal circumstances of its nature, we have been enabled to direct our attempts more rationally; but still from all that he has been able to collect, there are some material circumstances relative to the disease, which are not rightly, at least, not generally understood.

One general opinion among our ancestors, was, that every cataract had its different seasons of maturity, the term unripe implying a soft, and that of ripe, a hard, or firm state of the crystalline. Though this doctrine has been contradicted by some of the best modern practitioners, it not only still remains the opinion of many, but has a very considerable share in determining the preference of one method of operating over another.

Mr. Pott observes that the terms imply, and are generally understood to mean, that every cataract is at first soft through its whole substance; and that by degrees, in more or less time, it becomes hard and firm; or at least harder and firmer than the natural crystalline. Mr. Pott admits, that this latter circumstance may sometimes be true; but he affirms that it most frequently is not. Were this a merely speculative point, he remarks that it would be a matter of very little importance; but as a practical inference is drawn from it, that the early, or supposed unripe state is an improper one for an operation, and that a patient therefore should wait for a later or ripe one, it becomes a matter of considerable consequence to such person whether he shall, or shall not continue blind all that very uncertain space of time. But farther, the same doctrine implies, that the first degree or appearance of obscurity, however soft the crystalline may then be, will certainly be followed by an induration of it; or, in other words, that the crystalline is first rendered soft only to become hard afterwards; that this soft state is not proper for an operation, because it would necessarily render such an expedient unsuccessful; and that an increased degree of opacity and obscurity may in general be regarded as marks of increased firmness: not one of which is true.

The natural, sound, transparent crystalline, is very far from being uniform in consistence through its whole substance: its external part is much softer, and more gelatinous than its internal; which therefore, although equally transparent, may be said to form a kind of nucleus, and is always of a much firmer texture. From this sound and natural state, it is capable of several morbid alterations: it is capable of being dissolved, or of becoming fluid, without losing any thing of its transparency: it is capable of being dissolved into an apparently uniform fluid; of a strong gelatinous kind of consistence, but which will be more or less opake through the whole. It sometimes becomes opake whilst it undergoes a partial dissolution, which renders the different parts of it very unequal in consistence; and it now and then, though very seldom, becomes opake through its whole substance, and yet preserves its natural degree of firmness.

Whenever the crystalline becomes softer than it should be, or tends towards such a state, it is certainly distempered, and unfit for perfect vision, whether it be opake or not, or whatever its degree of opacity may be; but whoever supposes that such softened and opake crystalline will necessarily, or even frequently, acquire firmness, or become hard by time, is exceedingly mistaken. Opacity, though now and then accompanied by what is called induration, is no proof of it, nor of any tendency towards such an effect; so far from it, that some of the most dissolved or fluid cataracts, and which have been in that state for the greatest length of time, are found full as opake as those of the firmest kind.

Whoever has an opportunity of observing this distemper, and will embrace it, will find that cataracts which have in a length of time gone through all those alterations of colour, which are said to indicate either unripeness, or ripeness, are often as perfectly soft as they ever could have been; and, on the other hand, will sometimes find them what is called firm or hard very soon after the first appearance of obscurity. That is, to speak more properly, the former having been at first dissolved, have remained in the same state of dissolution; and the latter, having been at first only partially softened, have been found in the same unequal state with a firm nucleus. When, therefore, Mr. Pott makes use of the term induration, he does it in compliance with the common method of speaking; and not because he thinks it conveys, by any means, an adequate idea of the real alteration made in the state of the crystalline. It neither conveys an idea of the nature, nor of the extent of such alteration. With regard to the former, the term induration can, with propriety, be used only in opposition to a perfect or general distempered dissolution; by much the majority of what are called firm cataracts, being far less firm than the same crystalline was before such alteration. And in respect of the latter circumstance, the extent of the mischief, it is subject to the greatest uncertainty; being seldom or never an induration of the whole body, but most frequently a firmish kind of nucleus, of greater or less size, contained within more or less of a gelatinous, or softer kind of substance: so that the nucleus is called firm only in opposition to what envelopes it.

Instead, therefore, of using the term soft and

hard in opposition to each other, and as implying different effects either of time or disease on the crystalline, Mr. Pott thinks, we should say, that dissolution or softening, in some degree, is by much the most common effect: that, except in some few instances, where that body retains its natural firmness while it loses its transparency, the most frequent consequence is a softening of its texture, either partial or total: and that seven times in nine, when the crystalline becomes opake, and tends towards forming a cataract, it is more or less softened; sometimes equally through its whole substance, sometimes partially, having a greater or less portion left undissolved. This undissolved part, which always constitutes what is called a hard cataract, may indeed be called firm in opposition to the softer, by which it is surrounded; but even this very part is hardly, if ever, so firm as the center of the natural and sound crystalline.

With respect to the treatment: if the disease be in the incipient state, mercury, particularly calomel in small doses, has been attended with some advantage. When any degree of inflammation is present, blood-letting and cooling regimen will sometimes be necessary. Electricity, extract. hyoscyami, flammulæ Jovis, &c. have likewise been extolled; but after these or other remedies have failed, the cure must depend upon a chirurgical operation. For this purpose the two methods, to be described, are in general use. The first of them, practised a long time before the other, and called couching, is done with a view to allow the rays of light to fall upon the retina. It consists in removing the lens from its capsule, and lodging it in some part of the vitreous humour, where it may be away from the axis of the eye, and where it is supposed, in course of time, to be absorbed. The other method is termed extraction, where, after an incision has been made in the cornea, the lens is pushed through the pupil, and then entirely removed from the eye. Each of these methods has been much practised, and it is still a matter of doubt to which we ought to give the preference. The following arguments employed by Mr. Pott are, however, deserving of the most attentive consideration.

It is agreed by all who have attentively considered the subject, that the colour alone of a cataract furnishes no satisfactory proof of its consistence; and that they which appear greyish, bluish, or like whey, are sometimes found to be firm and resistent, while those that are more equally white are often perfectly soft.

Mr. Pott recommends to the consideration of such as may have an opportunity to examine, whether, when the opake crystalline is quite dissolved, so as to form a soft cataract, it is not, at the same time, somewhat enlarged, and whether when such dissolution does not take place, and what is called a hard cataract is formed, the crystalline is not in some degree lessened or shrunk.

Among the circumstances which induce him to be of this opinion, is the following, viz. when the pupil has been observed to be always in a state of dilatation, even when exposed to a strong light, and although capable of motion, yet never to contract in the usual manner, he has most commonly found the cataract to have been soft; and, on the contrary, when the pupil has been capable of full and perfect contraction over the cataract, he thinks it has most commonly proved firm; and this difference he has more than once observed in the different eyes of the same person. The greater degree of facility with which the firm cataract quits its place, and passes through the pupil upon the division of the cornea, does not lessen the probability of this opinion. Mr. Pott also wishes that they who have opportunity would enquire, whether the cataracts which have been found perfectly soft, have not, in general, become gradually more and more opake by very slow degrees, and, in length of time, the patient feeling little or no pain: likewise whether such as are firm do not, in general, become hastily opake; and are not preceded, or accompanied by severe, and deeply-seated pain in the head, particularly in the hinder part of it.

What has hitherto been said, chiefly regards the theory of the disorder, and may therefore, perhaps, be reckoned of little importance; but Mr. Pott observes, that when the influence which those opinions may have, and indeed have had, on practice, is considered, it will be found to be a matter of some consequence.

He farther observes, that since the operation of extracting the cataract, instead of depressing it, has been introduced into practice, it has been the humour to exaggerate all the objections to which the latter has been said to be liable; and that in such a manner, that they who have not had frequent opportunities of seeing business of this kind, fall, without reflection, into the prevailing opinion, seem to wonder that the operation of couching should ever have had any success; and at the same time are, from the accounts given, inclined to believe, that the extraction is always safe, easy, and successful.

The objections made against the operation of couching, at least those which have an apparent plausibility, Mr. Pott observes, are reducible to four.

1. That if the cataract be perfectly soft, the operation will not be successful, from the impossibility of accomplishing the intention of it.

2. That if it be of the mixed kind, partly soft, and partly hard, it will also most probably fail of success, not only from the impracticability of depressing the softer parts, but also because the more firm ones will either elude the point of the needle,

and remaining in the posterior chamber, still form a cataract; or getting through the pupil into the anterior chamber, will there bring on pain and inflammation, and induce a necessity of dividing the cornea for their discharge.

3. That if the cataract be of the firm solid kind, and therefore capable of being depressed, yet, in whatever part of the eye it shall happen to be placed, it will there remain undissolved, solid, and opake; and although removed from the pupil, yet prove some hindrance to perfect vision.

4. That however successfully the depression may have been accomplished, yet that the operation will necessarily occasion such disrangement of the internal parts of the eye, as must cause very considerable mischief.

Mr. Pott observes, that these objections, if they have any real weight, are of equal force in every species of cataract; and therefore are the more worthy of our attention; since, if they be founded on truth, they render the operation improper: but if they be not, misrepresentation and fashion should never induce us to lay aside any means which have been, and still may be, advantageous to mankind. The first and second, from frequently repeated experience, he affirms not to be true. He means that the operation of couching will not necessarily, or even generally be unsuccessful, merely because the cataract shall happen to be either partially or totally soft. On the contrary, although those states will prevent perfect depression, yet, by the judicious use of the needle, a recovery of sight, the true end and aim of the operation, will be as certainly and as perfectly obtained, as it could have been either by depression or by extraction in the same subject; and that generally without any of the numerous and great inconveniences which most frequently attend the latter operation.

The third objection, our author observes, is specious, and therefore very generally credited. That it never happens, he will not take upon him to say, because so many have asserted it. But, he adds, when we consider how few have written from their own examination and experience, our faith will not be quite implicit. He is certain from repeated experience, that this opinion has not that foundation in truth which it is generally supposed to have; and that it has been hastily embraced without sufficient enquiry.

In prosecuting the evidence on this subject, Mr. Pott remarks, that when the opake crystalline is in a state of dissolution, or the cataract is what is called perfectly soft, if the capsula of it be freely wounded by the couching-needle, the contents will immediately issue forth, and mixing with the aqueous humour, will render it more or less turbid; sometimes so much as to conceal the point of the needle, and the iris of the eye from the operator.

This is a circumstance, he continues, which has been observed by most operators, and has been mentioned by many writers; but it has always been regarded as an unlucky one, and in some degree preventive of success; which is so far from being the fact, that respecting this circumstance merely, all the benefit that can be derived from the most successful depression, or extraction, most frequently attends it; as Mr. Pott has seen in numerous instances.

The aqueous humour, however turbid it may become, will in a short space of time, be again perfectly clear; and if no disorder of the capsula of the crystalline, previous or consequential, prevents, the rays of light will pass without obstruction through the pupil, and the patient will be restored to as perfect vision as could have followed the most successful operation of either, or of any kind in the same subject, and under the same circumstances.

When the cataract is of the mixed kind, partly soft, and partly hard, the immediate effects of the needle are somewhat different; the soft part of the cataract being less in quantity, as well as generally less soft, the aqueous humour is less turbid; and the firm part or parts of the crystalline will be very visible. In this state, those former parts will very frequently elude the attempts made by the needle to depress them; and will therefore remain in the posterior chamber. This is also reckoned one of the unfortunate circumstances; but though to an operator not aware of, nor acquainted with the consequence, it may have all the appearance of being so, yet, as Mr. Pott observes, it really is not; the true end and aim of the operation not being thereby necessarily frustrated. In this case, if the needle has been so used as to have wounded the capsula very slightly, it will sometimes happen, that the firm part of the crystalline will remain in its nidus, and still form a cataract, which may possibly require a re-application of the instrument. This, Mr. Pott observes, is the worst that can happen, and happens indeed very seldom. For if the capsula be properly wounded, so that the aqueous humour be freely let in, the firm part or parts, though very visible at first, and preventing the passage of light through the pupil, will in due time, in some longer, in others shorter, gradually dissolve, and at last totally disappear, leaving the eye as fair, as clear, and as fit for vision as any the most successful operation could have rendered it.

In order to ascertain the fact with greater certainty, Mr. Pott, when he has found the cataract to be of the mixed kind, has sometimes not attempted depression, but has contented himself with a free laceration of the capsula; and having turned the needle round and round between his finger and thumb, within the body of the crystalline, has left all the parts in their natural situation. In

those cases he has hardly ever known them fail of dissolving so entirely as not to leave the smallest vestige of a cataract. In a few instances, where he has had fair opportunity, he has pushed the firm part through the pupil into the anterior chamber, where it has always gradually and perfectly dissolved and disappeared, without producing any pain or trouble during the whole of that time.

Mr. Pott observes, that, if the remarks above mentioned be well founded, some other important consequences will result from them.

First, If the soft cataract will, when its capsula is properly wounded, mix with the aqueous humour, and undergo so perfect a dissolution and absorption, as to leave the eye fair, clear, and fit for vision, and which he has often experienced beyond any doubt, it will then follow, that the softness of a cataract is so far from being an unlucky circumstance, that it is rather a fortunate one; as it enables the patient to receive the more early assistance; and that from an operation attended with less pain, and a less violation of parts, than a firmer one would necessarily acquire.

Secondly, When the cataract is of the mixed kind, and which therefore frequently baffles all the attempts towards depression, the firmer parts may very safely be left for dissolution, and vision be thereby restored.

Thirdly, When the cataract shall happen to be of the firmer kind, and, during an unsuccessful attempt to depress, get through the pupil behind the cornea, disappointment will be so far from being the consequence, that, if no other injury has been done to the parts within than what such attempt necessarily required, the displaced crystalline will gradually dissolve and disappear; and the patient will recover his vision as perfectly as he could have done by any operation.

Mr. Pott remarks, it may be objected, that what he has alleged tends only to prove, that both the soft and mixed cataract, when blended with the aqueous humour by the laceration of the capsula, will dissolve; but the firm one will not, and therefore must remain, wherever placed, a solid opake body.

To this objection he answers, in the first place, that, if what has been said relative to the soft and mixed cataract be true, he cannot help thinking that it is very advantageous. In the second place, that the opinion concerning the indissolubility of the displaced crystalline has, he thinks, been taken up, and propagated without sufficient authority from experiment, and rests merely on a few accidental observations, which are by no means satisfactory. In the third place, that, so far as his own enquiry and observations go, he is satisfied that it does dissolve wherever placed, provided it be perfectly freed from its attachment in its natural nidus.

He also observes, that both men and books mention firm, hard, entire, uniform cataracts, as if they were equally so with those which are found in the eye of a boiled fish. Whence they borrow this idea, he says, he knows not, unless it be from boiled fish; certain he is, that it is not from nature.

Let any man, for instance, examine the most firm, opake crystalline taken from the eye of a living person, and which, from its firmness, passed out through the pupil and the divided cornea with the greatest facility, he will generally find it to be in figure, size, and consistence, exceedingly unlike either to the natural and sound crystalline, or to one rendered opake by heat; and he will also find, that such alteration of shape and size is owing to a partial dissolution of its surface, particularly its interior one. In short, if he examines it carefully, and without prejudice, he will see, that what Mr. Pott calls an entire, firm cataract, is most frequently little more than the nucleus of an opaque crystalline.

If a man, Mr. Pott observes, might be allowed to argue in a case of this kind, a priori, he might very reasonably ask, why should the corpus crystallinum, which, although opake, is, while in its natural situation, and enveloped in its proper capsula, so prone to dissolve, be supposed to be as prone to induration, immediately upon being removed from its place?

The most strenuous advocates for extraction, he remarks, must admit, that a portion or portions of a firm cataract, which they have been obliged to leave behind in the operation, dissolve and disappear in due time. It is, says he, a fact not to be contradicted: but the same people allege, that the entire cataract will not. What idea they, who argue thus, have of an entire cataract, Mr. Pott knows not; they may possibly conceive it to be depressed, still remaining enveloped in a firm capsula, and therefore to remain indissoluble. But if they would reflect on the extreme firmness of the capsular membrane; on the necessary action of the couching needle, when applied to it, and on the different consistence of the different parts of every, even the most opake and firm cataract, they must see that it is only a portion of a cataract, however firm, which can in general be depressed.

One of the arguments adduced by some of the late writers, in favour of extraction, is, that as the crystalline *must be destroyed*, if it be only displaced, it had better be removed. But, observes Mr. Pott, how can it be said to be destroyed, if it be only displaced, and remain indissoluble? Let them, continues he, take which side of the argument they please, they must be wrong. For if the

diseased crystalline remains, though depressed, a solid body within the eye, how can it be said to be destroyed? and on the other hand, if it be destroyed in the operation of couching, it must be by dissolution; and therefore cannot remain.

The last objection to the operation of couching is, that it must necessarily derange and violate the internal parts of the eye, particularly the vitreous humour. Mr. Pott observes, that if what he has said on the subject of the perfectly soft cataract as well as on that which is partially so, be true, the greater part, if not the whole of this objection, will cease, with regard to those two; and it will be principally, if not totally, confined to that which is called firm and hard, and which, by its resistance to the instrument, will admit of being placed in the inferior part of the eye.

In performing this operation, the needle may certainly be so used, as to do considerable mischief; but then it must be from the unskilfulness or awkwardness of the operator, and which may be the case of every operation in surgery. But, says Mr. Pott, is an operation justly chargeable with the bad consequences deducible merely from its having been ill executed?

Mr. Pott admits that much mischief has been done by attempts to couch; but, in the first place, they have almost always been the consequence of want of judgment, or want of dexterity in the operator; and in the next place, even under the most exaggerated representations, they are by no means equal to what has frequently been the consequence of attempts to extract.

This experienced practitioner observes, it may possibly be supposed, that he has conceived a prejudice against the operation of extraction. Of this he is not conscious. He both sought and embraced every opportunity which a public hospital, and many years practice afforded him of operating in both ways, and of comparing the consequences. He had seen many of the patients of others, not only of the gentlemen of the profession, but of most of the itinerant operators, and was thereby convinced, that the greater part of the objections to the operation of couching are invalid, have not been the result of unprejudiced experience, or a candid regard for truth; that only the fair and prosperous side of the question, regarding the operation of extraction, has been industriously exhibited, while its manifold failures and ill consequences have been as industriously concealed; and that, upon a fair detail and comparison of all the advantages and disadvantages, conveniences and inconveniences attending each, the preference will be found justly due to the needle. To inconveniences and disappointments Mr. Pott observes that both operations are too liable; but, from the most cool and candid attention to fact, he is convinced that the former are much greater, and the latter much more frequent, in the operation of extraction, than in that of depression, executed with the same degree of judgment.

When the operation of *couching* is to be performed, the following is the method of doing it:—To guard as much as possible against the effects of inflammation, the patient should be confined, for several days previous to the operation, to a low regimen; and two or three doses of some cooling laxative should be given at proper intervals. After this he is to be seated with his face towards the light; but sun-shine ought to be avoided. Some, however, prefer a side-light, both on account of the operator and patient. One assistant is to support the head, while others secure the arms. The operator is either to be seated with his elbow resting upon a table; or, which is preferred by some, he ought to stand, resting his arm upon the side of the patient. The eye being fixed by the speculum, (pl. xvi. fig. 7.). or in such manner as to allow the whole of the cornea and a small portion of the sclerotic coat to protrude, a couching needle (fig. 1.) is to be held in the right-hand, as we hold a pen, if the left eye be the subject of operation; the ring and little fingers are to be supported upon the cheek or temple of the patient: the needle is to be entered in an horizontal direction through the sclerotic coat, a little below the axis of the eye, and about one-fourth of a line behind the edge of the cornea, so as to get entirely behind the iris. If the needle be of the flat form, the flat side ought to be opposed to the iris, to prevent that substance from being wounded. The point of the needle is to be carried forwards till it be discovered behind the pupil. The operator is now commonly directed to push the point into the lens, and depress it at once to the bottom of the eye; but in this way the lens either bursts through the capsule at an improper place, or it carries the capsule with it, tearing it from the parts to which it is connected. Instead of this, the needle ought first to be pushed into the lens near its under edge, as Dr. Taylor advises, and then carried some way down into the vitreous humour, so as to clear the way for the lens. It is then to be drawn a little back, and carried to the upper part of the capsule, when, by pressing upon it, the lens, if solid, is to be pushed down by one, or, if fluid, by several movements, to the bottom of the vitreous humour. It should then be pushed downwards and outwards, as Mr. Bell directs, so as to leave it in the under and outer side of the eye; where, in case it should rise, the passage of the light would be little obstructed. The needle is then to be withdrawn, the speculum removed, and the eylids closed; and a compress soaked in a saturnine solution is to be applied over them. Mr. Pellier's method is to cover each eye with a linen bag half filled with fine wool, ap-

plied dry, and fixed to a circular bandage of linen passed round the forehead: the whole is retained by a triangular napkin. The patient is then to be laid in bed, upon his neck, with his head very little raised: and to be kept in this situation for about a week in a dark room. Unless he be of a weakly habit, he ought to be bled at the neck, or leeched at the temple, a few hours after the operation. He should be kept upon low diet, and get small doses of opiates frequently repeated. His belly should be kept moderately open by gentle purgatives. The dressings should not be removed till inflammation is at least so far gone that no danger will arise from uncovering the eye, which may generally be about the eighth or tenth day. Sometimes the patient perceives light immediately on the dressings being removed, but more frequently not till some time after.

Upon removing the dressings, if the cataract has again got back to the axis of the eye, a repetition of the operation may become necessary. Some time, however, after the inflammatory symptoms are gone, should be allowed to elapse before any other operation is attempted; for the cataract frequently dissolves, provided the aqueous humour get free access to it. Mr. Pott sometimes, when he found the cataract to be of the mixed kind, did not attempt depression, but contented himself with a free laceration of the capsule; in which cases the lens hardly ever failed of dissolving so entirely as not to leave the smallest vestige of a cataract. When the operation is to be performed upon the right eye, the straight needle must either be used by the left-hand, or the operator must place himself behind the patient. A needle (plate xvi. fig 2.) has been contrived, however, with a large curve, by which the operation may be readily performed with the right-hand, while the surgeon is placed before the patient; only the needle is entered towards the inner, instead of the outer, angle of the eye.

The first hint of *extracting the crystalline lens* seems to have been suggested by Mr. Petit, who proposed to open the cornea and extract the lens when it was forced into the anterior chamber of the eye either by external violence or accidentally in couching. At first it was considered as a dangerous operation, and was seldom practised till about the year 1737, when Mr. Daviel proposed and practised extraction in preference to couching. The operation is performed in the following manner: the patient and operator being placed, and the eye fixed in the same manner as for couching, the speculum, when the operation is to be done upon the left eye, is to be held in the left hand of the operator. It is necessary to make as much pressure as will secure, without hurting, the eye. Neither ought the cornea to be pressed too near the iris, lest the latter be wounded. The operator now takes the knife (fig. 3.), and holds it in the same way as he does the needle for couching; he then enters the point of it, with the edge undermost, into the cornea, about the distance of half a line from its connection with the sclerotic coat, and as high as the centre of the pupil: he is then to pass it across the pupil to the inner angle in an horizontal direction, keeping the edge a little outwards to prevent the iris from being cut: the point is then to be pushed through opposite to where it entered: the under half of the cornea is next to be cut, and at the same distance from the sclerotica with the parts at which the point of the knife went into and came out from the eye.

In cutting the under half of the cornea, the pressure of the speculum upon the eye should be gradually lessened; for if the eye be too much compressed, the aqueous humour, with the cataract and part of the vitreous humour, are apt to be forced suddenly out immediately after the incision is made. The operator then takes a flat probe and raises the flap made in the cornea, while he passes the same instrument, or another probe (fig. 4.), rough at the extremity, cautiously through the pupil, to scratch an opening in the capsule of the lens. This being done, the eye should be shaded till the lens be extracted, or the eyelids are to be shut to allow the pupil to be dilated as much as possible; and while in this situation, if a gentle pressure be made upon the eyeball at either the upper or under edge of the orbit, the cataract will pass through the pupil more readily than it can do when the eyelids are open.

If the lens cannot be easily pushed through the opening of the cornea, no violent force should be used, for this would tend much to increase the inflammation. The opening should be enlarged, so as to allow the lens to pass out more freely. When the cataract does not come out entire, or when it is found to adhere to the contiguous parts, the end of a small flat probe, or a scoop (fig. 5.), is to be introduced, to remove any detached pieces or adhesions that may be present. The iris sometimes either projects too much into the anterior chamber, or is pushed out through the opening of the cornea. When this happens, it is to be returned to its natural situation by means of the probe.

Sometimes the opacity is not in the body of the lens, but entirely in the capsule which contains it. The extraction of the lens alone would here answer no useful purpose. Some practitioners attempt to extract, first the lens, and then the capsule by forceps; others, the lens and capsule entire. Those who have had much practice in this branch of surgery, as Pellier, say they find such a method practicable; but others think it better to trust entirely to time and a cooling regimen for the cure, which, in some instances, has taken place. When the operation is performed on the right

eye, the operator is either to use the left hand, to take his station behind the patient, or to employ the crooked knife (fig. 6.).

After the operation is finished, the eyelids are to be shut, and the same treatment observed as in couching. When the operation succeeds, the wound in the cornea is generally healed in little more than eight or ten days; but previous to this time, the eye ought not to be examined; and even then it should only be done in a dull light, otherwise it may suffer considerably from the irritation which a strong light might occasion. When the eye is to be examined, if the eyelids be found adhering together, they ought to be washed with some gentle lotion. With this the eye ought also to be occasionally washed afterwards, by which it will gradually recover strength and sight. About the end of the third week the dressing may be entirely removed, and a piece of green silk put over the eyes as a shade; and if every thing has succeeded, the patient may generally go out after a month from the time at which the operation was performed.

It sometimes happens, that, in extracting the lens, a portion of the vitreous humour is evacuated. This does not in general prevent the success of the operation. The eye soon begins to fill again, and in the course of two or three weeks, it is for the most part as large as it was previous to the operation. Whether this be owing to a renewal of the vitreous humour, or merely an aqueous secretion, is not yet determined; though the latter circumstance is generally deemed most probable.

CATARACT, VACILLATING; the *cataracte branlante* of Forlenze, a French writer in the "*Actes de la Société de Médecine à Bruxelles.*" This disorder, the author remarks, although it has been noticed by Celsus, and some other of the ancients, is neglected by the moderns, St. Ives alone having treated upon it, and that very slightly. He speaks of complete blindness in an elderly person from a gutta serena. The left eye exhibited, on examination, a very peculiar structure, the crystalline lens appearing to range in different directions, with a tremulous motion, according to the positions of the eye itself. This phenomenon has been attributed, by St. Ives, to an adherence of the iris to the capsule of the crystalline humour; and of the truth of that opinion our author seemed fully convinced in the present case: he therefore resolved to attempt effecting a separation of these two adhering parts, with the view of clearing up the nature of the disease, rather than with the hope of effecting a cure.

The patient being placed in the ordinary position, leaning his head on the bosom of an assistant, who with his two fore-fingers raised up the superior eyelid, Mr. Forlenze kept down the lower lid with his left fore-finger; and, at a moment when the patient was directing his eye outwardly, he plunged the scalpel obliquely, from above downwards and from without inwards, at the distance of a half line from the sclerotica. The incision being then carried forwards to the opposite angle of the eye, at the same distance from the sclerotic coat, a semilunar section was made through the inferior part of the cornea. At the same instant the operator likewise rested the extremity of his fore-finger upon the globe of the eye, to prevent its yielding, and to afford a point of support against his nail in the act of completing the incision downwards.

For the purpose of extracting the crystalline, Mr. F. employed a golden needle, mounted like the cataract-knife, nineteen lines in length, with cutting edges, flattened in the form of a lancet, and one line in breadth. This instrument, as well as the knife, was held in the manner of a writing-pen; and, being conducted under the flap of the cornea, he passed it into the posterior chamber of the eye, moving it in various directions, so as to destroy all the adhesions between the capsule of the crystalline and the iris. These adhesions, he says, were more firm at the inner and upper parts than below. The lens immediately escaped, with its capsule, without applying the smallest degree of pressure. The pupil remained perfect, and there appeared no derangement or dissolution of the vitreous humour, as Maître Jean pretends will happen in this case.

The slightest compresses and bandages were used. No accident happened till the sixth day, when a trifling ophthalmia supervened: but the event was quite as successful as could have been expected.

The author next offers the following reflections:—1. This case confirms the opinion of St. Ives, who thought it was occasioned by an adhesion of the iris with the capsule of the crystalline. 2. It proves that this adherence may be favoured by the immobility of the iris, arising from a palsy of its nerves; whence it follows, that a gutta serena is one of the causes of a vacillating cataract. 3. It appears from the foregoing case, that, in similar circumstances, relief ought to be attempted; and that it is possible, in destroying the adhesions, to obtain a degree of success which surgeons have not hitherto deemed practicable.

The instruments commonly used for opening the crytalline capsule will, in the above case, prove but a feeble resource for isolating the iris. The needle substituted by M. Forlenze, for the apparatus of Wenzel and La Faye, is much more simple and convenient.

M. Forlenze, in the same work, gives another case of complicated cataract: M. Carbonel, lieutenant-general of the artillery, in the 67th year of his age, had a disease of the left eye, with the following complications: 1. A capsular cataract; 2.

An adherence to the posterior part of the iris; 3. A liquidity of the crystalline. The author made a section through the cornea, as in the former case, and extracted the crystalline; but there was so firm an adhesion between the capsule and the posterior part of the iris, that syringing was not effectual, and it was necessary to dissect it off with his needle, assisted by the forceps. He then perceived an opacity and thickening of the hinder part of the capsule adjoining the membrane of the vitreous humour; which caused extreme difficulty in extracting the whole, and obliged him to cut the remaining portion of it into three pieces with a small pair of scissars. In performing this operation, above half of the vitreous humour escaped, and M. Chopart, who assisted him, thought there could be no hope of success: but the author, having been taught by past experience that the vitreous humour might be regenerated, gave a favourable prognosis. The patient did well, although an ophthalmia supervened, and he at length recovered his sight.

M. Forlenze treated a case of cataract, having its centre opaque and solid, but its circumference liquid and transparent, in the following way: After making a semilunar section of the cornea, and an incision into the capsule, the liquid part of the crystalline lens escaped; but the central portion, being firm, adhered to the posterior part of the capsule. The adhesion was destroyed by a curette; the remaining portion of the lens was then extracted, and a few drops of very pure warm water were injected by means of a curious syringe invented by the author. Some stress is even laid on the use of this syringe and lukewarm water, for the complete extraction of the accompaniments. The author disapproves of M. Anel's syringe, as being too capacious: his own is graduated, and will hold only twelve grains of water.

CATA'RIA, CAT-MINT or *nep*, a species of *nepeta.* Tournefort called the *nepeta* of Linnæus, by the name of *cataria.*

CATARRHA'LIS FE'BRIS, a catarrhal fever.

CATARRHE'XIS, (καταρρηξις, *a violent and copious eruption, or effusion*, from καταρρηγνυω, *to pour out*); a copious evacuation from the belly. In Vogel's *Nosology*, it is defined, a discharge of pure blood from the intestines, such as takes place in the dysentery.

CATA'RRHUS, (καταρρος, *a defluxion: from* καταρρεω, *to flow down*), *catarrheuma*, or *coryza*; a CATARRH. It is an increased secretion of mucus from the membranes of the nose, fauces, and bronchiæ, with pyrexia, and attended with sneezing, cough, thirst, lassitude, and want of appetite. It is a genus of disease in the class *pyrexiæ*, and order *profluvia*, of Cullen. There are two species of catarrh, viz. *catarrhus à frigore*, which is very commonly called a cold in the head; and *catarrhus à contagione*, the INFLUENZA, which sometimes seizes a whole community. Catarrh is also symptomatic of several other diseases: hence we have the *catarrhus rubeolosus; tussis variolosa, verminosa, calculosa, phthisica, hysterica, a dentitione, gravidarum, metallicolarum, &c.*

Practical writers and nosologists have distinguished the disease by different appellations, according as it happens to affect different parts of the mucous membrane, one part more or less than the other: but Dr. Cullen is of opinion that the disease in those different parts is always of the same nature, and proceeds from the same cause in the one as in the other. Very commonly indeed those different parts are affected at the same time; and therefore there is little room for the distinction mentioned. The disease has been frequently treated of under the title of *tussis* or *cough*; and a cough, indeed, always attends the chief form of catarrh, that is, the increased excretion from the bronchiæ; but as it is often also a symptom of many other affections, which are very different from one another, it is improperly used as a generic title.

The disease generally begins with some difficulty of breathing through the nose, and with a sense of some fullness stopping up that passage. This again is often attended with some dull pain and a sense of weight in the forehead, as well as a stiffness in the motion of the eyes. These feelings, sometimes at their very first beginning, and always soon after, are attended with the distillation of a thin fluid from the nose, and sometimes from the eyes; and these fluids are often found to be somewhat acrid, both by their taste and by their fretting the parts over which they pass. These symptoms constitute the coryza and gravedo of authors, and are commonly attended with a sense of lassitude over the whole body. Sometimes cold shiverings are felt; at least the body is more sensible than usual to the coldness of the air; and with all this the pulse is more frequent than ordinary, especially in the evening.

These symptoms have seldom continued long before they are accompanied with some hoarseness, and a sense of roughness and soreness in the trachea, with some difficulty of breathing, expressed by a sense of straightness in the chest, and with a cough which seems to arise from some irritation felt at the glottis. This cough is generally at first dry and painful, occasioning pains about the chest, and more especially in the breast; sometimes, together with these symptoms, pains resembling those of the rheumatism are felt in several parts of the body, particularly about the neck and head. With all these symptoms, the appetite is impaired, some thirst arises, and a feverish lassitude is felt all over the body. These symptoms mark the height and violence of the disease; but commonly it does not continue long. By degrees the cough comes to be attended with a more copious excretion of mucus;

which is at first thin, but gradually becoming thicker, is brought up with less frequent and less laborious coughing. The hoarseness and soreness of the trachea are also relieved or removed; and the febrile symptoms abating, the expectoration becomes again less, and the cough less frequent, till at length they cease altogether.

Such is generally the course of this disease, neither tedious nor dangerous; but it is sometimes in both respects otherwise. The body, affected with catarrh, seems to be more than usually liable to be acted on by cold air; and upon exposure of the body to fresh cold, the disease, which seemed to be yielding, is often brought back with greater violence than before, and is rendered not only more tedious than otherwise it would be, but also more dangerous by the supervening of other diseases. Some degree of the cynanche tonsillaris often accompanies the catarrh; and when this is aggravated by a fresh application of cold, the cynanche also becomes more violent and dangerous, from the cough which is present at the same time. When a catarrh has been occasioned by a violent cause, when it has been aggravated by improper management, and especially when it has been rendered more violent by fresh and repeated applications of cold, it often passes into a pneumonic inflammation, attended with the utmost danger.

Unless, however, such accidents as those happen, a catarrh, in sound persons not far advanced in life, is always a slight and safe disease: but, in persons of a phthisical disposition, a catarrh may readily produce an hæmoptysis, or perhaps form tubercles in the lungs; and still more readily in persons who have tubercles already formed in the lungs, an accidental catarrh may occasion the inflammation of these tubercles, and in consequence produce a phthisis pulmonalis.

In elderly persons, a catarrh sometimes proves a dangerous disease. Many persons, as they advance in life, and especially after they have arrived at old age, have the natural mucus of the lungs poured out in greater quantity, and requiring a frequent expectoration. If, therefore, a catarrh happen to such persons, and increase the afflux of fluids to the lungs, with some degree of inflammation, it may produce the peripneumonia notha, or more properly chronic cartarrh, a disease continuing often for many years, or at least regularly every winter; which in such cases is very often fatal.

The *proximate cause* of catarrh seems to be an increased afflux of fluids to the mucous membrane of the nose, fauces, and bronchiæ, in consequence of a degree of inflammation affecting the same. The latter circumstance is confirmed by this, that, in the case of catarrh, the blood drawn from a vein commonly exhibits the same inflammatory crust which appears in the case of phlegmasiæ. The remote cause of catarrh is most commonly cold applied to the body. This application of cold producing catarrh is generally evident and observed; and Dr. Cullen is of opinion that it would always be so, were men acquainted with and attentive to the circumstances which determine cold to act upon the body.

The application of cold which occasions a catarrh, probably operates by stopping the perspiration usually made by the skin, and which is therefore determined to the mucous membrane of the parts above mentioned. As a part of the weight which the body daily loses by insensible evacuation, is owing to an exhalation from the lungs, there is probably a connection between this exhalation and the cutaneous perspiration, so that the one may be insreased according as the other is diminished; and therefore we may understand how the diminution of cutaneous perspiration, by the application of cold, may increase the afflux of fluids to the lungs, and thereby produce a catarrh.

Dr. Cullen remarks, that there are some observations of Dr. James Keil which may render this matter doubtful; but says, there is a fallacy in those observations. The evident effects of cold in producing coryza, leave the matter, in general, without doubt; and there are several other observations which shew a connection between the lungs and the surface of the body.

Whether from the suppression of perspiration, a catarrh be produced merely by an increased afflux of fluids, or whether, in addition to this, the matter of perspiration be at the same time determined to the mucous glands, and there excites a particular irritation, may be uncertain; but Dr. Cullen thinks the latter supposition is most probable.

Although in the case of a common catarrh, which is in many instances sporadic, it may be doubtful whether any morbific matter be applied to the mucous glands; we are, however, certain, that the symptoms of a catarrh do frequently depend upon such matter being applied to these glands; as appears from the case of measles, chincough, and especially from the frequent occurrence of contagious and epidemical catarrh. See INFLUENZA.

Considering the number of persons who are affected with catarrh, of either the one species or the other, and escape from it quickly without any hurt, it may be allowed to be a disease commonly free from danger; but it is not always to be treated as such, for in some persons it is accompanied with pneumonic inflammation. In the phthisically disposed, it often accelerates the coming-on of phthisis; and in elderly persons it often proves fatal in the manner we have explained above, viz. by degenerating into its chronic state. But though chronic catarrh be often the termination of that species which arises from cold, we have not, in any case, observed it to arise as a consequence of the catarrh from contagion. This species of ca-

tarrh, however, is not unfrequently followed by phthisis; or rather where a phthisical tendency before existed, the affection has been begun and its progress accelerated from this cause.

The *cure* of a catarrh is nearly the same, whether it proceeds from cold or contagion; only, in the latter case, remedies are commonly more necessary than in the former. In the cases of a moderate disease, it is commonly sufficient to avoid cold, or to abstain from animal food for some days. In some cases, where the febrile symptoms are considerable, it is proper for that length of time to lie a-bed, and, by taking frequently some mild and diluent drink, a little warmed, to promote a very gentle sweat; and after this to take care to return but very gradually to the use of the free air. When the disease is more violent, not only the antiphlogistic regimen, exactly observed, but various remedies also, become necessary. To take off the phlogistic diathesis which always attends this disease, blood-letting, more or less, according as the symptoms shall require, is the proper remedy. After blood-letting, for restoring the determination of the fluids to the surface of the body, and at the same time for expediting the secretion of mucus in the lungs, which may take off the inflammation of its membrane, a vomit is the most effectual means. For the last-mentioned purpose, some suppose that squills, gum-ammoniac, the volatile alkali, and some medicines of that class, might be useful; but being of a stimulant quality, their efficacy has never been found considerable; and if squills have ever been very useful, it seems to have been rather by their emetic than by their expectorant powers. When the inflammatory affections of the lungs seem to be considerable, it is proper, besides blood-letting, to apply blisters to the back or sides.

As a cough is often the most troublesome circumstance of this disease, so demulcents may be employed to alleviate it. See DEMULCENTS. But after the inflammatory symptoms are much abated, if the cough still remains, opiates afford the most effectual means of relieving it; and, in the circumstances just now mentioned, they may be very safely employed. The following is directed by Dr. Saunders of London:

> ℞ Tinct. opii gutt. xx.
> Aq. cinnam. ℥j.
> Syr. papav. errat. ʒij. Misce.
> Sit haustus, nocte dormituro dandus.

Very considerable advantage is often derived from employing opiates in such a maner as to act more immediately on the head of the wind-pipe. For this purpose, opium may often be advantageously conjoined with demulcents, melting slowly in the mouth. And perhaps no form is more convenient, or answers the purpose better than the *trochisci glycyrrhizæ cum opio* of the Edinburgh Pharmacopœia, where purified opium is combined with extract of liquorice, gum-arabic, and other demulcents, to the extent of about a grain in a drachm of the composition. After the inflammatory and febrile states of this disease are very much gone, the most effectual means of discussing all remains of the catarrhal affection, is by some exercise of gestation diligently employed. Dr. Fordyce's observations on the treatment of catarrh, are so peculiarly judicious, that we think it necessary to give them here at large. He says the cure is performed,

1. By weakening the system, by evacuation, according to the general inflammation, or the strength of the patient.

If therefore there should be considerable *inflammatory diathesis*, and especially if the breast be the part affected, we are to bleed from ℥xii. to xvi. and repeat the operation if the hardness of the pulse, &c. continue: but if the inflammatory symptoms be not great, and do not affect the whole habit, it is unnecessary; and when the patient is weak, and the secretion thin, and in great quantity, it is even sometimes hurtful.

Purging also diminishes the inflammation, and may be likewise used when the secretion is too great.

> ℞ Tamarind. ʒiij.
> Coque in aq. font. ℥vj. per v. minut.
> Colatur. adde,
> Natr. vitriolat. ʒvj. ad x. Vel.
> Sal. polychrest. rupell. ʒiv. ad vj.
> Mannæ ℥ss.
> Tinct. sennæ ℥iij.
> Fiat potio purgans. Capt. mane ij. vicibus, intervallo horæ ss.

When the *inflammatory diathesis* is not very considerable, or where it has been diminished by bleeding, after the purgative in the evening an opiate may be used.

> ℞ Aq. cinnam. ℥jss.
> Sp. cinnam. ʒiij.
> Syr. papav. alb. ℥ss. ad ℥j.
> Antim. tart, gr. ¼ ad gr. ss.
> Fiat haust. hora somni sumendus.

If the inflammatory symptoms should continue, or the secretion be still too great, the purgative, and, when proper, the opiate, may be repeated after a day's interval.

2. By taking off the inflammation when it occupies the breast, especially if there be any acute pain, by means of blisters applied as near to the part principally affected as possible; or when the

throat is sore, or there is hoarseness, by using demulcents.

3. By promoting the secretion where it is not sufficient. See the articles PERIPNEUMONIA and ANGINA.

4. By giving mucilaginous medicines to cover the mucous membrane and allay the cough.

℞ Sem. lini ℥ss.
Aq. bull. ℥iv.
Infunde simul per horam. Dein adde,
Aq. bull. ℥xx.
Syr. Limon. ℥ij.
Colaturæ bibat. cyath. calid. frequenter.

℞ Aq. puleg. ℥jss.
Sperm. ceti ʒss.
Vitelli ovi q. s.
Syr. tolut. ʒiij.
Fiat haust. quartâ quâque horâ sumendus.

When the complaint is slight, these mucilaginous medicines are often sufficient for the cure.

5. By restoring the circulation to the skin by antimonials and other relaxants which are useful in all cases; and where the inflammatory symptoms are much diminished, or have not come on, opiates are added to them with advantage.

℞ Opii gr. iij.
Extr. gentian gr. x.
Antim. tart. gr. ij.
Fiat. pil. viij. Cap. unam ter indies.

When the inflammation is great, the patient should be confined to vegetable farinaceous food, and the drink should be mucilaginous warm infusions, or decoctions, acidulated; and he ought to be confined to a room moderately warm: but in slighter cases this is not necessary.

Nothing contributes more to the cure than avoiding exposure to cold, especially in those circumstances where it has the greatest effect on the system; and this precaution is particularly necessary in those naturally liable to the disease, or where it has continued long, or when there have been frequent relapses.

If it be drawn out to a great length, and the secretion has weakened the patient, strengthening remedies are to be employed; and riding on horseback in a pure dry air is frequently of service; but these are only to be practised when there is little or no inflammation. Resinous pectoral medicines have sometimes been given here also with success.

℞ Gum. myrrh. pulv. ℈j.
Nitri pur. gr. x.
Fiat pulvis ter die sumendus.

Besides the remedies above mentioned, Dr. Mudge, in a treatise on this disease, recommends the steam of warm water as a most efficacious and safe remedy for a catarrh, and which indeed he seems to consider as little less than *infallible.* The method of breathing in these steams is very simple, but he gives a caution to people in health, who may accidentally see his machine, not to make the experiment of breathing through *cold* water with it, or they will be almost certain of catching a severe cold. We have given a description of this useful contrivance under the article INHALER; his directions for the use of it by those troubled with catarrh are as follow:

"In the evening, a little before bed-time, the patient, if of adult age, is to take three drachms, or as many tea-spoonfuls, of tinct. opii camph. in a glass of water: if the subject be younger, for instance under five years old, one tea-spoonful; or within that and ten years, two. About three quarters of an hour after, the patient should go to bed, and, being covered warm, the inhaler three parts filled with water nearly boiling (which from the coldness of the metal, and the time it ordinarily takes before it is to be used by the patient, will be of a proper degree of warmth), and being wrapped up in a napkin, but so that the valve in the cover is not obstructed by it, is to be placed at the armpit, and the bed-clothes being drawn up and over it close to the throat, the tube is to be applied to the mouth, and the patient should inspire and exspire through it for about twenty minutes or half an hour.

"It is very evident, as the whole act of respiration is performed through the machine, that in inspiration the lungs will be filled with air which will be hot, and loaded with vapour, by passing through the body of water; and, in exspiration, all that was contained in the lungs will, by mixing with the steam on the surface of the water, be forced through the valve in the cover, and settle on the surface of the body under the bed-clothes.

"The great use of this particular construction of the inhaler is this, first, as there is no necessity, at the end of every inspiration, to remove the tube from the mouth, in order to exspire from the lungs the vapour which had been received into them, this machine may therefore be used with as much ease by children as older people. And, secondly, as a feverish habit frequently accompanies the disorder, the valve in that respect also is of the utmost importance: for a sweat, or at least a free perspiration, not only relieves the patient from the restless anxiety of a hot, dry, and sometimes parched skin, but is also, of all evacuations, the most eligible for removing the fever; and it will be generally found, that, after the inhaler so constructed has been used a few minutes, the warm vapour under the clothes will, by settling on the trunk, produce

a sweat, which will gradually extend itself to the legs and feet.

"In a catarrhous fever, or any feverish habit attending this cough, it would be proper to take a draught of warm thin whey a few minutes before the inhaler be used; and after the process is over, the sweat which it has produced may be continued by occasional small draughts of weak warm whey or barley-water. The sweating is by no means so necessary to the cure of the catarrhous cough, as that the success of the inhaler against that complaint at all depends upon it; yet I cannot help once more remarking, that when this disorder happens to be accompanied with a feverish habit, the advantages of this particular construction will be very important.

"After this respiratory process is over, the patient usually passes the night without the least interruption from the cough, and feels no farther molestation from it than once or twice in the morning to throw off the trifling leakage which, unperceived, had dripped into the bronchiæ and vesicles during the night; the thinner parts of which being evaporated, what remains is soon got rid of with a very gentle effort."

In concluding this part of his subject, Dr. Mudge thinks it right, very pointedly to observe, that, if the patient means not to be disappointed by his assurances or his own expectations, it is essentially necessary that the following remarks, with regard to the time and manner of using this process, should be strictly attended to:

First, That as tender valetudinary people are but too well acquainted with the first notices of the disorder, the remedy must, or ought to be, used the same evening; which will, in an ordinary seizure, be attended with an immediate cure: but if the soreness of the respiratory organs, or the petulance of the cough, show the cold which has been contracted to have been very severe, the inhaler, without the opiate, should be again repeated for the same time the next morning.

Secondly, If the use of the inhaler, &c. be delayed till the second night, it will be always right to repeat it again the next morning without the opiate, but with it if the seizure has been violent.

Lastly, If the cough be of some days standing, it will be always necessary to employ both parts of the process at night and the succeeding morning, as the first simple inflammatory mischief is now most probably aggravated by an additional one of a chronic tendency.

"But if," continues the Dr. "through the want of a timely application, or a total neglect of this or any other remedy, the cough should continue to harass the patient, it is, particularly in delicate and tender constitutions, of the utmost consequence to attempt the removal of it as soon as possible, before any floating acrimony in the constitution (from the perpetual irritation) receives an habitual determination to an organ so essential to life as the lungs.

"If the patient expectorate with ease and freedom a thick and well-digested inoffensive phlegm, there is generally but little doubt of his spitting off the disorder, with common care, in a few days; and till that be accomplished, a proper dose of tinct. opii camph. for a few successive nights will be found very useful in suppressing the fatiguing irritation and ineffectual cough, occasioned by a matter which, dripping in the early state of the disease into the bronchiæ during the night, is commonly at that time too thin to be discharged by those convulsive efforts.

"If, however, notwithstanding a free and copious expectoration, the cough should still continue, and the discharge, instead of removing the complaint, should itself, by becoming a disease, be a greater expence than the constitution can well support, it is possible that a tender patient may spit off his life, through a weak, relaxed pair of lungs, without the least appearance of purulence, or any suspicion of suppuration. In those circumstances, besides, as was mentioned before, increasing the general perspiration, by the salutary friction of a flannel waistcoat, change of situation, and more especially long journeys on horseback, conducted as much as possible through a thin, sharp, dry air, will seldom fail of removing the complaint.

"But, on the contrary, if the cough should, at the same time that it is petulant and fatiguing to the breast, continue dry, husky, and without expectoration, provided there be reason to hope that no tubercles are forming, or yet actually formed, there is not perhaps a more efficacious remedy for it than half a drachm of gum ammoniacum, with eighteen or twenty drops of tinctura opii, made into pills, and taken at bed-time, and occasionally repeated. This excellent remedy Sir John Pringle did me the honour to communicate to me; and I have accordingly found it, in a great many instances, amazingly successful, and generally very expeditiously so; for it seldom fails to produce an expectoration, and to abate the distressing fatigue of the cough. In those circumstances I have likewise found the common remedy of ʒss or ℈ij. of *bals. sulph. anisat.* taken twice a-day, in a little powdered sugar, or any other vehicle, a very efficacious one. I have also, many times, known a salutary revulsion made from the lungs by the simple application of a large plaster, about five or six inches diameter, of Burgundy pitch between the shoulders; for the perspirable matter, which is locked up under it, becomes so sharp and acrid, that in a few days it seldom fails to produce a very considerable itching, some little tendency to inflammation, and very frequently a great number of

boils. This application should be continued (the plaster being occasionally changed), for three weeks or a month, or longer, if the complaint be not so soon removed.

"And here I cannot help observing, that though seemingly a trifling, it is however by no means an useless, caution to the tender patient, not to expose his shoulders in bed, and during the night, to the cold; but when he lies down to take care they be kept warm, by drawing the bed-clothes up close to his back and neck.

"If, however, notwithstanding these and other means, the cough, continuing dry or unattended with a proper expectoration, should persevere in harassing the patient; if, at last, it should produce, together with a soreness, shooting pains through the breast and between the shoulders, attended also with shortness of the breath; and if, added to this, flushes of the cheeks after meals, scalding in the hands and feet, and other symptoms of a hectic, should accompany the disorder; there is certainly no time to be lost, as there is the greatest reason to apprehend that some acrimony in the habit is determined to the tender substance of the lungs, and that consequently tubercular suppurations will follow. In this critical and dangerous situation, I think I can venture to say from long experience, that, accompanied with change of air and occasional bleedings, the patient will find his greatest security in a drain from a large scapulary issue (see Issue), assisted by diet of asses' milk and vegetables."

CATA'RRHUS A CONTAGIONE: the second, third, and fifth species of catarrh of Sauvages are included under this title by Dr. Cullen. The catarrh which is propagated by contagion is popularly named influenza. See Influenza.

CATA'RRHUS BELLINSULA'NUS, i. e. the Mumps, or Cynanche Parotidæa.

CATA'RRHUS SUFFOCATI'VUS, the croup, or Cynanche trachealis.

CATA'RRHUS SUFFOCATI'VUS BARBADE'NSIS, the croup, or Cynanche trachealis.

CATA'RRHUS VESI'CÆ, the same as *glus*. See Glus.

CATASTA'GMUS, (καταςαγμος, from ςαζω, *to distill);* a name which the Greeks, in the time of Celsus, used for distillation.

CATASTA'LTICUS, (καταςαλτικος, from κα-ταςελλω, *to restrain*, or ςελλω, *to contract);* a term used to signify any thing styptic, astringent, or corrugating.

CATASTASIS, (καταςασις); a term denoting the constitution, state, or condition of any thing.

CATATASIS, (κατατασις), a term in Hippocrates, which means the extension of a fractured or dislocated limb, in order to replace it. Also the actual replacing it in a proper situation was so called.

CATAVA'LA, a name for the common Aloe.

CATECHU, (from *kate*, in the Japanese language, a tree, and *chu*, juice), otherwise named *terra Japonica*, Japan earth. It is an extract prepared in India from the juice of the *Mimosa catechu spinis stipularibus, foliis bipinnatis multijugis, glandulis partialium singulis, spicis axillaribus geminis seu ternis pedunculatis*, Linn. Class, *Polygamia*. Order, *Monœcia*. In Dr. Fothergill's account of the tree, we are told that the wood is extremely hard and heavy: the interior part varies from a pale brown to a dark red, approaching to black in different plants, but always covered with one or two inches thick of white wood. It is one of the most common trees to be met with on the uncultivated mountains of Rotas and Pallamow, districts of Hindostan, in the province of Bahar, westward of Bengal, and frequent in many other neighbouring parts.

From the interior coloured wood is produced the extract erroneously called *Terra Japonica*, which is thus made: After the tree is cut down, all the exterior or white part is pared off and cast away; the interior coloured wood is cut into chips, with which a narrow-mouthed unglazed earthen pot is filled: to this as much water is added as will rise to the upper chips; when this is half evaporated by boiling, the decoction is poured into a flat earthen pot, and boiled to one-third part: this is set in a cool place for one day, and afterwards evaporated by the heat of the sun, stirring it several times in the day: when it is reduced to a considerable consistence, it is spread upon a mat or cloth, which had previously been covered with the ashes of cow-dung; this mass is divided into square pieces by a string, and completely dried by turning them frequently in the sun, until they are fit for sale. In making the extract, the pale brown wood is preferred, as it produces the fine whitish extract: the darker the wood is, the blacker the extract, and of less value. The preparers of this extract are very careless in keeping it free from foreign matters; in consequence of which it has a considerable quantity of ashes, &c. mixed with it. Mr. Kerr, who got this account, says that he never could learn that the terra Japonica was produced from the areca, or betel-nut, (see Areca), nor indeed does he think it credible that it should, as its price would far exceed that of the terra Japonica, if the preparation was from the areca. Where the latter is made, it is used in dying; for painting chintz and other cloth. When joined with salts of iron, a black colour is produced; mixed with oil, they paint the beams and walls of their houses, to preserve them from the destructive white ants.

Some specimens of this drug are of a pale reddish brown colour, others are of a dark blackish brown, or black like bitumen: some are ponderous, others light, some compact, others porous, some more,

others less astringent; and these differences happen according to the manner of obtaining them, &c.

In the Edinburgh New Dispensatory Dr. A. Duncan describes two kinds of this extract; one sent from Bombay, the other from Bengal. The extract from Bombay is of a uniform texture, and of a red brown tint, its specific gravity being generally about 1.39. The extract from Bengal is more friable and less consistent. Its colour is like that of chocolate externally; but when broken, its fracture presents streaks of chocolate and of red brown. Its specific gravity is about 1.28. Their tastes are precisely similar, being astringent, but leaving in the mouth a sensation of sweetness. They do not deliquesce or apparently change by exposure to the air, and are not fusible.

Mr. Davy, professor of chemistry to the Royal Institution, examined these substances. According to his analysis, 200 grains gave

	Bombay.	*Bengal.*
Of Tannin, - - -	109	97
Peculiar extractive matter,	68	73
Mucilage, - - -	13	16
Residuum, chiefly of sand and calcareous earth, - -	10	14

Catechu may be employed for most purposes where an astringent is indicated; and it is particularly useful in alvine fluxes. Besides this, it is employed also in uterine profluvia, in laxity and debility of the viscera in general, in catarrhal affections, and various other diseases where astringents are indicated. It is often suffered to dissolve leisurely in the mouth, as a topical astringent for laxities and exulcerations of the gums, for aphthous ulcers in the mouth, and similar affections; and it is in some other cases applied externally, both under the form of ointment and that of a solution.

The officinal preparations are, Infus. *Edin.* Elect. *Edin. Dubl.* Tinct. *Edin. Lond.*

CATEIADION, a long instrument which the ancient surgeons introduced into the nostrils, in order to provoke an hæmorrhage for the cure of the head-ach. It is mentioned by Aretæus.

CATESBÆA, the LILY-THORN, a genus in Linnæus's botany. There is but one species.

CATHÆRESIS, (καθαιρεσις, from καθαιρεω, *absumo, to waste*). Hippocrates uses this word for such a consumption of the body as happens without any manifest evacuation; but Scribonius Largus, and some others, express by it such a weakness as arises from purging or other debilitating means.

CATHÆRETICA, (καθαιρετικα); remedies which consume superfluous flesh, otherwise named escharotics. See ESCHAROTICS.

CATHARMA, (καθαρμα, from καθαιρω, *to purge*); the excrements purged off from any part of the body.

CATHARSIS, (καθαρσις); a term used by the old writers to denote purgation, whether by the menses, lochia, urine, or stool; in any way either natural or artificial.

CATHARTICA, (καθαρτικα, from καθαιρω, *to purge*), CATHARTICS; medicines which evacuate the intestines downwards; or, as the common language is, excite motions by stool. This evacuation is necessarily produced by increasing the peristaltic motion of the intestines; but Dr. Cullen observes, that there are various states of the system which, without the application of any medicine, may occasion this; such as obstructed perspiration, cold applied to the lower extremities, and some other circumstances not necessary to be further taken notice of here.

Of the class of remedies termed *cathartic* the first thing to be observed is, that the substances employed are of different degrees of force or power in producing the evacuation. Hence it is that Dr. Cullen, in his Lectures on the Materia Medica, has arranged them under the two titles of *Cathartica Mitiora* and *Cathartica Acriora.*

He conceives, that there are substances which are only capable of stimulating the extremities of the exhalant vessels, or the excretories of the mucous follicles; by both which irritations, a large quantity of fluids may be drawn into the cavity of the intestines, and a copious evacuation by stool may thus be produced, without much increase of the peristaltic motion.

But though he puts this supposition, he does not certainly determine that there are any medicines which thus act upon the excretories without stimulating the muscular fibres of the intestines. Indeed, he believes it most safe to suppose, that every medicine which increases the evacuation by stool, acts more or less by stimulating the moving fibres of the intestines.

This, therefore, being supposed, he enquires if there be not a difference in the nature of the stimulus given by different cathartics. He is persuaded that such a difference may actually be perceived. In Glauber's salt, for example, a stimulus is applied to the moving fibres of the intestines; but it does not seem to be capable of exciting inflammation in the coats or fibres of the intestines, nor of exciting heat in any other part of the system; whereas in jalap there is an acrid resin, which, when applied in a certain manner, inflames the intestines, and excites a considerable degree of heat in the system. These two substances he takes for examples of the double arrangement that may be made of cathartics, and the grounds on which he speaks of them under the two heads already mentioned. To the first set he applies the term *laxatives*, and to the other the term of *purgatives*; intending, by these appellations, not to express the degree of power, as has been usual, but the manner of their operation.

In considering the more general effects of cathartics, he says,—" The first effect of them to be taken notice of, is the very general one of their promoting the evacuation of the contents of the intestines for the time present in them; which may be especially necessary when any unusual, noxious, and acrid matters are present. The next circumstance is, that the operation of cathartics extends to the whole length of the alimentary canal, from the upper orifice of the stomach to the lower extremity of the rectum. There may be substances which are particularly suited to promote the evacuation of the stomach downwards, but we are uncertain of this; and we mean here to observe, that the operation of cathartics, though only and directly on the intestinal canal, serves to evacuate the stomach. Hence it is that cathartics are so often useful in many of the disorders of this important organ.

" In the next place, we are to consider more strictly the operation of cathartics upon the intestinal canal, and the effects of this upon the intestines themselves; and these are, in the first place, to promote the peristaltic motion when preternaturally slow or obstructed. The slowness of the peristaltic motion seems to be often in fault; but it is not easy, in different cases and persons, to say when it is preternaturally so. The frequency of stools is very different in different persons; and it is not determined what is natural and most healthy in this respect. What seems to be most probable is, that in every one a stool should occur once in the course of every twenty-four hours, and we believe that this is most frequently the case; but there are so many instances of longer intervals without any inconvenience, that it is very doubtful if, with respect to different persons, this could be established as a general rule. Every considerable deviation, however, from a diurnal stool, may be considered as an approach to a morbid state.

" It is, however, to be observed, that, besides the delay of stools, there is another circumstance to be taken notice of, which is, that whenever stools are delayed, it is probable that there is especially a slowness in the action of the large intestines, by which a greater proportion of fæces is accumulated there, and these acquire also a greater degree of firmness and hardness; whence they are often voided with difficulty and pain, and thereby give occasion to many disorders in the lower intestines, and even in the whole system. This is what we name a state of costiveness, and which generally depends upon the slowness of the peristaltic motion, and upon what is the consequence of this, the increased bulk and hardness of the fæces."

As in this state the use of cathartics of one kind or other is generally indicated, Dr. Cullen enquires more particularly into the causes producing it. The first he assigns is the weakness of the peristaltic motion; and accordingly it is observed that a slow belly is often attended with other marks of that weakness, and on that account occurs very frequently in women, who suffer many inconveniences from it. But another cause of a costive habit is of a contrary kind; depending upon the vigour and rigidity of the alimentary canal. In this state, as some degree of torpor always attends strength, so the contents of the intestines are moved more slowly onwards: but at the same time the concoction of the aliments, is more completely performed, and probably a smaller proportion of fæces produced. At the same time also, as the absorption of the more liquid parts is more considerable, a smaller proportion of fæcal matter is deposited in the great guts, and that also in a drier state. From both of these circumstances we may, perhaps, understand, why, in rigid and robust persons, a costiveness is so frequently complained of. It is nearly the same with hypochondriac or melancholic persons; in whom, with rigid viscera, there is a preternatural torpor in the motions of the whole system, and particularly in the intestinal canal.

Dr. Cullen mentions some other causes of costiveness. One of these, he says, may be a deficiency of bile, which is supposed to be a chief means of promoting the motion of the intestines downwards. We cannot indeed always perceive when this occurs; but, that it may occur, is fairly to be presumed from the case of a jaundice, which is commonly attended with a slow belly. But although the deficiency of bile, or of pancreatic liquor, cannot always be perceived to be the cause of costiveness, we can with great probability, as a cause of it, assign the abstraction of the other intestinal fluids. This Dr. Cullen supposes to happen from an increased perspiration, which he has more frequently observed to be the effect of some very constant mode of gestation, than the result of bodily exercise; and it is in this manner that he accounts for the effects of the constant gestation in sailing, in producing costiveness, which so generally happens to persons at sea.

To the foregoing causes of costiveness arising from the state of the system, one other remains to be added; and that is, any considerable compression of the intestines from a steatomatous tumor of the omentum; or that pressure which also happens so frequently from the contents of the uterus in pregnant women.

Besides these several causes of a preternatural slowness in the peristaltic motion of the intestines, indicating the use of cathartics, these remedies also are indicated when the passage of the contents is entirely interrupted. This happens when any portion of the intestine is affected with a spasmodic and somewhat permanent constriction, attended with pain, which is named colic; and

this, with some other obstructions of the intestinal canal, require the free use of cathartic remedies.

After mentioning these operations of cathartics upon the intestines themselves, Dr. Cullen proceeds to consider the effects of their operation upon the other parts of the human system.

"The first of these to be mentioned," says he, "is the evacuation and diminution of the fluids that takes place with respect to the whole system. The great length of the intestinal canal, holding generally in its cavity a quantity of liquid matter, and therefore this alone, when carried out more suddenly by the operation of cathartics, may often afford a large evacuation; but when it may be presumed that the cathartics at the same time excite all the excretions by which liquids are commonly poured into the intestines, as bile, pancreatic juice, ordinary exhalation, and the effusion of mucus ready to be poured out, it will be evident that cathartics, even by a moderate stimulus applied, may occasion a very large evacuation and diminution of the fluids of the body; and this more considerably as the stimulus applied to the moving fibres of the intestines is stronger.

"Consequently it is obvious, that the evacuation by stool may be so large as to diminish the quantity of fluids in the whole system; and therefore, that whenever such a diminution is indicated, it may be obtained by the use of such medicines: and I need not say that particularly by this means any preternatural increase of the activity, or of the active powers of the system, may be thus greatly diminished.

"It is at the same time, however, to be remarked, that although, by purging, a great debility of the system may be induced, it may not produce any great evacuation of the sanguiferous system. A large evacuation by stool may sometimes be merely of the contents for the time present in the intestines, and therefore not drawn from the blood-vessels: and though the evacuation may be still larger by what is drawn from the mucous follicles, this we know may be very copious from the matter contained in the follicles themselves, without much liquid being drawn from the blood-vessels. The evacuation indeed may also be increased by what is drawn from the arteries by the exhalant vessels; but as this must be drawn off slowly, in very divided portions, it can have little effect, and at least no sudden effect in the depletion of the sanguiferous system: and from the whole it will appear, that the evacuation by stool may be very large, without much effect in taking off the tension and tone of the blood-vessels. In this respect, indeed, it seems to fall far short of the powers of blood-letting, though this be contrary to the common opinion, and even contrary to the practice of Sydenham; but accordingly we have not found purging to be of very great effect in taking off the phlogistic diathesis of the system."

Besides the effect of cathartics in producing a general evacuation of the whole system, Dr. Cullen observes, that purging is powerful in changing the distribution of the blood into the several parts of it.

"The circumstances," says he, "according to which the distribution of the blood is made into the several parts of the system, we suppose to be commonly known, and to this effect, that if an evacuation is made from one set of vessels, the afflux of fluids will be increased in these, and that the afflux into other parts of the system will at the same be diminished. Upon this principle it will be readily understood, that if the afflux of fluids in the descending aorta is increased, as it must be by purging, the afflux must in some proportion be diminished in those vessels which carry the blood to the head. By this the quantity and impetus of the blood in the vessels of the head must be diminished by purging; and hence it is that this operation of cathartics has been often found so useful in the diseases of the head.

"It has been frequently supposed that purging, by drawing from the superior parts, may be of use also in the diseases of the thorax, and in several circumstances it may possibly be so; but practitioners have frequently observed, that, in the inflammatory diseases of the lungs, purging has not been so useful as might be expected. It is probably owing to this, that by emptying the system of the descending aorta, no considerable derivation can be made from the bronchial arteries, in the extremities of which the inflammations of the lungs are seated.

"Many circumstances show, that there is a balance in the distribution of the blood between the external and internal parts, so that they mutually increase or diminish one another. We have shown above, that the increase of perspiration abstracts the fluids that should be poured into the intestines; and it has been frequently observed, that an obstructed perspiration has occasioned a diarrhœa. If this change of distribution, therefore, is in general the nature of the economy, it will be readily understood why purging, by increasing the afflux of blood to the internal, should diminish that to the external parts, or to the surface of the body, and that it should, therefore, have considerable effects in many cutaneous diseases. Whenever these depend upon any inflammatory determination to the surface of the body, purging may be a remedy for them; and when it is foreseen that, in certain diseases, such an inflammatory determination to the skin is to arise, and according to its violence to aggravate the disease, it will be evident that purging, by moderating or taking off that deter-

mination, may render the disease more moderate. This I take to be the foundation of the practice of purging in the approach and beginning of the small-pox; and I have no doubt that this, in concurring with other measures, contributes to the mildness of the disease.

"Purging, therefore, may be of use in cutaneous affections; and physicians have very universally employed this remedy in those cases, but often very improperly, as they have not attended to this, that cutaneous affections are often purely topical, and unconnected with any general state of the system, and therefore not to be cured by remedies chiefly affecting this. And, upon this occasion, I cannot help taking notice, that medical men have considered purging too much as a means of evacuating acrimony diffused over the whole system; and as cutaneous eruptions were commonly considered a mark of this, so, upon a doubly false principle, cathartics have been more frequently employed in these affections than they ought to have been."

Another effect of cathartics still remains to be mentioned. Dr. Cullen says, that as, in every cavity of the body, there is an exhalation and absorption to be constantly going on, it is presumed that there is some balance constantly preserved between the secretory and absorbent powers; so that if the former are increased, the latter will be augmented also: and therefore, that when the secretions are upon any occasion much increased, the action of the absorbents may be particularly excited. In this way he explains the reason why purging often excites the action of the absorbents, to take up more copiously the fluids that were otherwise stagnant in the adipose membrane or other cavities of the body, and thereby often proves a cure, or at least affords relief, in dropsical cases.

These are the ordinary effects of cathartics, as they are commonly observed when taken in by the mouth. It is proper, however, to observe, that there are two other ways in which these remedies are applied: the one is, by applying or anointing them on the teguments of the lower belly, a practice not very efficacious, and therefore little, if at all, resorted to by practitioners; the other is, by applying them to the intestinum rectum, either in a solid form (see SUPPOSITORIUM), or else by injecting them in a liquid form, by way of clyster (see CLYSTER). The latter is well known to be a necessary, and very often a most useful, practice; and the medicines most proper to be employed in it are familiar to every practitioner.

The particular cathartics are enumerated under MATERIA MEDICA, and described under their several names. Some valuable remarks of the late Dr. George Fordyce, on the action of purgatives, and more especially on the effects produced by their combination, will be found under the article PRESCRIPTION.

CATHERETICS, an old term for those medicines which destroy fungous flesh in wounds or ulcers. They are the same with caustics and escharotics. See ESCHAROTICS.

CATHETER, (καθετηρ; from καθιημι, *to thrust into)*; a long tube, that is introduced by surgeons into the bladder, to remove the urine when the patient is unable to pass it naturally. They are either made of silver or of the elastic gum. That for the male urethra is much longer than that for the female, and so curved, if made of silver, as to adapt itself to the urethra.

The use of this instrument is required in the following cases:

1. When a stone, by lying internally on the neck of the bladder, stops the discharge of the urine.

2. When there exists a preternatural weakness of the bladder, so as to hinder the urine from being discharged in the natural manner; and when other remedies are unsuccessful, as often happens in women weakened with labour, &c.

3. When, by a very long retention of the urine, the bladder is weakened by distension, so as not to be able to discharge its contents.

4. When mucus, pus, or coagulated blood, obstruct the neck of the bladder; as in cases of ulceration, or wounds of the kidneys.

5. When the urethra or the neighbouring parts are contracted or obstructed, or the neck of the bladder; or when the prostatæ are scirrhous and enlarged, so as to prevent the passing of urine.

6. In the last months of pregnancy, when it is sometimes useful to draw off the urine artificially.

7. When a prolapsus uteri produces an ischury, as it very commonly does.

To introduce the catheter into the bladder of a man is sometimes difficult. The easiest method is for the patient to lie on his back, and the operator to take the penis in his left hand, as he stands on the patient's left side, reclining the penis towards the navel; then he is to introduce the catheter, with its concave part to the belly, into the urethra, so far as the os pubis; and so thrusting it under the symphysis of those bones, and moving the handle, somewhat in a circular position, he gently forces it into the bladder. Most surgeons, however, prefer the introduction of it after the manner to be described below.

If too small a catheter be used, it is apt to stop in the corrugations and foldings of the urethra. This oftener occurs in old men. Dr. Hunter observes, that some impediments are often met with at the caput gallinaginis, in which case he advises us to draw the catheter a little back; then press the end of it a little higher, and it will slip in; but he cautions against using any force. If a difficulty is still found, he advises to put a finger into the anus, at the same time drawing the perinæum

forward, and thus endeavour to assist the catheter in its introduction.

In a paper on this subject, by Mr. Ware, he says, the mode in which he passes the catheter is as follows: "Being first thoroughly oiled, I introduce it into the urethra, with its convex part uppermost, and carry it as far as it will pass without using force; then I turn it *slowly* round, so as to bring its concave side uppermost; and, in doing this, I make a large sweep with the handle of the instrument, and at the same time keep my attention fixed steadily on its apex, or inner termination, which I take particular care neither to retract, nor to move from its first line of direction. When the catheter is turned, it must still be pressed onward, and its handle at the same time gently depressed: by this method it will be made to enter the bladder."

The length and shape of this instrument are also matters of greater importance than is commonly imagined. The catheter made use of by Mr. Ware is twelve inches long, which is more than an inch above the ordinary length; and the curvature is larger than common. It is represented in Plate xvi. in which the figure is reduced to two-thirds of the size recommended. With this Mr. Ware says he has succeeded often, where others of a different size and curvature had failed.

"The part of the operation of introducing the catheter," says Mr. Ware, "on which, I believe, its success chiefly depends, is the preservation of the apex of the instrument, at the time of turning its concave side uppermost, in the right direction of the urethra; so that it may not then press against the sides of this canal. In order to make my meaning better understood, I will suppose a person to press the apex of a catheter, with its convex side uppermost, against his finger, or any other resisting body. If he turns the instrument suddenly round, so as to bring its concave side uppermost, he will find, unless he uses great care, that its apex will be moved from its place, and take a new direction, different from that which it followed before he made the turn. A similar effect takes place when the instrument is in the urethra; and if, in that case, on the turn of the instrument, its apex, instead of pressing straight forward in the urethra, should take its direction against the sides of the canal, no additional pressure, afterwards, can make it advance. For this reason, instead of turning the instrument suddenly, in the way recommended by Mr. Bromfield, I always make the turn slowly, and give the handle of the catheter a large sweep round; and this large sweep of the handle is accomplished much more readily when the instrument is unconfined, than it can be when the penis is drawn forwards over it, in the way recommended by Mons. Le Dran."

Previous to any attempt to evacuate the bladder by the use of a catheter, a bougie should be introduced. This alone, in many instances, will prove sufficient to procure the discharge required. Not unfrequently we may also succeed, in drawing off the urine, with a hollow bougie made of elastic gum. But notwithstanding these successes, which are familiar to every surgeon, cases will still often occur, which the catheter alone can relieve.

CATHERI'SMUS, (καθετηρισμος; from καθετηρ, *a catheter)*; the term given by Paulus Ægineta to the operation of introducing the catheter. See CATHETER.

CATHI'DRYSIS, (καθιδρυσις, from καθιδρυω, *to place together)*; the reduction of a fracture.

CA'THMIA; a name for litharge.

CATHO'LICON, (καθολικον, from κατα, *through*, and ολον, *all)*; a term applied formerly to medicines that were supposed to purge all the humours: it also denoted a *panacea*, or universal medicine; but such are now laughed at, and justly considered as gross impositions.

CATHY'PNIA, (from κατα, and υπνος, *sleep)*; a profound but unhealthy sleep.

CA'TIAS, (κατιας); an incision knife, formerly used to extract a dead fœtus, and for opening an abscess in the uterus.

CATI'LLIA; a term denoting the weight of nine ounces.

CA'TOCHE, (κατοχη), a *catalepsy;* also a coma somnolentum. See CATALEPSIS.

CA'TOCHUS, (κατοχος), a *catalepsy;* or, according to others, a rigidity of the body without sensibility. See CATALEPSIS.

CA'TOCHUS CERVI'NUS; the tonic tetany, particularly affecting the neck.

CA'TOCHUS DIU'RNUS; an occasional tetany.

CA'TOCHUS HOLOTO'NICUS; another name for the tonic tetany.

CATO'PTER; the instrument called SPECULUM ANI.

CATOTE'RICA, (κατωτερικα); a term denoting purging medicines.

CATU'RUS; a genus in Linnæus's botany. He enumerates two species.

CAU'CAFON, i. e. MOLY INDICUM.

CAU'CALIS; bastard parsley; a genus in Linnæus's botany. He enumerates seven species.

CAU'DA, (from *cado*, to fall); a tail. Aëtius describes a fleshy substance that arises from the os uteri in women, and fills the vagina. Sometimes, he says, it protuberates without the lips of the pudenda, like the tail of some animal; whence this name is given to it.

CAU'DA; a name for the os COCCYGIS.

CAU'DA EQUI'NA; the *equisetum* of Linnæus, or *horse-tail*, a genus of plants. See EQUISETUM.

CAU'DA EQUI'NA; the lumbar fasciculi, from their origin to the extremity of the os sacrum, form, through the whole canal of the lumbar vertebræ and of the os sacrum, a large bundle of nervous ropes, called by anatomists cauda equina, because of some resemblance which it bears to a horse's

tail, especially when taken out of, and extended in, clear water. To have a clear idea of this, it is necessary to speak of the nerves of the medulla spinalis, which are thus accurately described by Mr. Fyffe.

The nerves formed by the lateral union of the anterior and posterior filaments of the medulla spinalis, proceed out of the bony canal of the spina dorsi, toward each side, through the intervertebral holes, through the anterior holes of the os sacrum, and the lateral notches of the os coccygis; and from thence they have the general name of *vertebral nerves.* They are divided, in the same manner as the vertebræ, into seven pair of cervical nerves, twelve pair of dorsal, five pair of lumbar, and five pair of sacral.

As the spinal marrow which furnishes all these nerves, seldom goes lower than the first or second vertebra of the loins, the situation of the fasciculi of nervous filaments must be different from that of the holes through which they pass; and several of these fasciculi, both anterior and posterior, must be longer than the rest. This we find to be actually the case.

The fasciculi of nervous filaments of the medulla spinalis, which produce the cervical nerves, run more or less transversely toward each side from their origin to their passage through the intervertebral holes. The fasciculi which form the dorsal nerves run a little obliquely downward from their origin to the intervertebral holes; and those which form the lumbar nerves run down more and more longitudinally from the medulla to the holes by which they go out.

The cervical fasciculi, therefore, are very short in the spinal canal; the dorsal fasciculi are longer, and the fasciculi from the loins and os sacrum very long. We may likewise observe, that the fasciculi of the four lowest pairs of the cervical nerves, are broader and more compounded than the following, because the branchial nerves are a continuation of these. The filaments belonging to the lumbar nerves, and those of the os sacrum, are likewise very broad, and made up of numerous filaments, as being the roots of the larger nerves which go to the lower extremities. The dorsal filaments are very minute.

The cervical and lumbar fasciculi are not only broader, and consist of more filaments than the dorsal, but they are also situated much closer to each other, the lumbar fasciculi being still more so than the cervical; whereas, in the dorsal, a considerable interstice is left between the fasciculi.

These lumbar fasciculi, from their origin to the extremity of the os sacrum, form, through the whole canal of the lumbar vertebræ and of the os sacrum, a large bundle of nervous ropes, which are the cauda equina.

Though the medulla spinalis ends at the first vertebra of the loins, the vagina of the dura mater, by which it is invested, is continued through the rest of the bony canal all the way to the extremity of the os sacrum, and involves the cauda equina, the cords of which pierce it on each side, nearly opposite to the places where they pass through the intervertebral holes, and the anterior holes of the os sacrum, almost in the same manner as the vertebral nerves.

After this vagina of the dura mater is detached from the spinal canal, by cutting the transverse branches which go out of the intervertebral holes, it appears to have evident marks of elasticity, for it immediately shrinks up, as an artery does when cut across. Therefore, its true length, and also that of the lateral elongations, must be taken while it is *in situ.*

From all this, Mr. Fyffe draws a conclusion of great importance, not only in anatomical and philosophical enquiries, but also for understanding local diseases, wounds, &c. which is, that, when we have occasion to consider any particular nerves near the vertebræ of the back or loins, or near the os sacrum, we must remember that, in the spina dorsi, the origin of these nerves is not even with their passage out of the spine, but proportionably higher. If, for instance, we enquire about any of the lowest sacral nerves near the os coccygis, we must not stop at the extremity of the os sacrum, but trace its origin as high as the last vertebra of the back, or first of the loins.

The membrana arachnoides accompanies the original fasciculi separately, to their passage through the lateral elongations of the dura mater, forming a kind of duplicature, with breaks, or discontinuations, between the cords which run in the vagina of the dura mater. The pia mater adheres very closely both to the fasciculi and filaments of which they consist. See MEDULLA SPINALIS.

CAU'DA MU'RIS; a species of RANUNCULUS.

CAU'DA PORCI'NA, i. e. PEUCEDANUM.

CAUDATIO. An elongation of the clitoris in women is so called by the old writers.

CAU'DEX, by Malpighi and other botanists, is used to signify the stem or trunk of a tree; by Linnæus, the stock or body of the root, part of which ascends, part descends. The ascending part raises itself gradually above ground, serving frequently for a trunk, and correspends in some measure to the *caudex* of former writers. The descending part strikes gradually downward into the ground, and puts forth radicles or small fibres, which are the principal and essential part of every root. The descending caudex therefore corresponds to the radix of other botanists. Agreeably to this idea, Linnæus considers trees and shrubs as roots above ground; an opinion which is confirmed by the well known fact, that trees, when inverted, put forth leaves from the descending cau-

dex, and radicles or roots from the ascending. For the varieties in the descending caudex, see the article RADIX.

CAUL, in anatomy, the popular name for the *Omentum*. See OMENTUM. The term *caul* is likewise applied to a thin membrane encompassing the heads of some children when born. It is only a portion of the membranes of the fœtus; which usually break, but sometimes pass forward along with the child. It is an idle superstition with sailors' wives, that possessing one of these will preserve their husbands from being shipwrecked.

CAULE'DON, (καυληδον, because it breaks like καυλὸς, *a branch)*; that species of fracture where the bone is broken transversely, so as not to lie immediately in contact.

CAU'LIAS, (καυλιας); an epithet for that juice of the Silphium which flows from the stalk, by way of distinction from that which flows from the root, and is called ριζιας.

CAULIFEROUS, in botany, an epithet applied to such plants as have a stalk.

CAULIFLOWER, a much esteemed species of cabbage. See BRASSICA. The flower is cut before the parts of fructification have had time to expand; and when sufficiently boiled, it is tender and delicate eating.

CAU'LIS, (from καυλος), in botany, the stalk or stem. The stalk of a tree is called its trunk. Linnæus defines it to be the proper trunk of the herb, which elevates the leaves and fructification. The stalks of the ferns, grasses, palms, and mushrooms, are distinguished by particular names. This term was formerly confined to herbs only.

CAU'LIS PROCU'MBENS, a procumbent or trailing stalk; or that which lies on the ground, and propagates itself by emitting roots, as the ivy and strawberry.

CAU'LIS SCA'NDENS, a climbing stalk; or that which climbs by the help of tendrils, as the vines and briony, &c.

CAU'LIS VOLU'BILIS. A twining stalk is that which twists about any prop, without the help of tendrils, as the hop, kidney-bean, &c.

CAULO'DES, the white or green cabbage.

CAULO'RAPA, cabbage-turnep. A species of Brassica.

CAU'LOS, a stalk. This word is used by way of eminence to express the stalk of SILPHIUM or LASER.

CAULO'TON, (καυλωτον), a name given to the BEET.

CAU'MA, (καυμα, from καιω, *to burn)*; the heat of the atmosphere, or, of the body in a fever.

CAU'NGA, a name of the ARECA.

CAU'RIS, a name given by some to the genus of shells called, by the generality of writers, *porcellana* and *concha venerea*. It is from a false pronunciation of this word *cauris* that we call these shells *gowries*.

CAUSE, that from whence any thing proceeds, or by virtue of which any thing is done: it stands opposed to effect. We get the ideas of cause and effect from our observation of the vicissitude of things, while we perceive some qualities of substances begin to exist, and that they receive their existence from the due application and operation of other beings. That which produces, is the cause; and that which is produced, the effect: thus, fluidity in wax is the effect of a certain degree of heat, which we observe to be constantly produced by the application of such heat.

Aristotle, and the schoolmen after him, distinguished four kinds of causes; the efficient, the material, the formal, and the final. This, like many of Aristotle's distinctions, is only a distinction of the various meanings of an ambiguous word: for the efficient, the matter, the form, and the end, have nothing common in their nature, by which they may be accounted species of the same genus; but the Greek word, which we translate cause, had these four different meanings in Aristotle's days, and we have added other meanings. We do not indeed call the matter or the form of a thing its cause; but we have final causes, instrumental causes, occasional causes, and many others. Thus the word cause has been so hackneyed, and made to have so many different meanings in the writings of philosophers, and in the talk of the vulgar, that its original and proper meaning is confounded.

With regard to the phenomena of nature, the important end of knowing their causes, besides gratifying our curiosity, is, that we may know when to expect them, or how to bring them about. This is very often of real importance in life; and this purpose is served, by knowing what, by the course of nature, goes before them and is connected with them; and this, therefore, we call the cause of such a phenomenon. If a magnet be brought near to a mariner's compass, the needle, which was before at rest, immediately begins to move, and bends its course towards the magnet, or perhaps the contrary way. If an unlearned sailor is asked the cause of this motion of the needle, he is at no loss for an answer. He tells you it is the magnet: and the proof is clear; for, remove the magnet, and the effect ceases; bring it near, and the effect is again produced. It is, therefore, evident to sense, that the magnet is the cause of this effect.

A Cartesian philosopher enters deeper into the cause of this phenomenon. He observes, that the magnet does not touch the needle, and therefore can give it no impulse. He pities the ignorance of the sailor. The effect is produced, says he, by magnetic effluvia, or subtile matter, which passes from the magnet to the needle, and forces it from

its place. He can even show you, in a figure, where these magnetic effluvia issue from the magnet, what round they take, and what way they return home again. And thus he thinks he comprehends perfectly how, and by what cause, the motion of the needle is produced. A Newtonian philosopher enquires what proof can be offered for the existence of magnetic effluvia, and can find none. He therefore holds it as a fiction, an hypothesis; and he has learnt that hypotheses ought to have no place in the philosophy of nature. He confesses his ignorance of the real cause of this motion, and thinks that his business as a philosopher is only to find from experiment the laws by which it is regulated in all cases. These three persons differ much in their sentiments with regard to the real cause of this phenomenon; and the man who knows most is he who is sensible that he knows nothing of the matter. Yet all the three speak the same language and acknowledge that the cause of this motion is the attractive or repulsive power of the magnet.

What has been said of this, may be applied to every phenomenon that falls within the compass of medical philosophy. We deceive ourselves, if we conceive that we can point out the real efficient cause of any one of them. The grandest discovery ever made in natural philosophy, was that of the law of gravitation, which opens such a view of our planetary system, that it looks like something divine. But the author of this discovery was perfectly aware that he discovered no real cause, but only the law or rule according to which the unknown cause operates. Natural philosophers, who think accurately, have a precise meaning to the terms they use in the science; and when they pretend to show the cause of any phenomenon of nature, they mean by the cause, a law of nature of which that phenomenon is a necessary consequence.

The whole object of philosophy, as Newton expressly teaches, is reducible to these two heads: first, by just induction from experiment and observation, to discover the laws of nature; and then to apply those laws to the solution of the phenomena of nature. This was all that this great philosopher attempted, and all that he thought attainable. And this indeed he attained in a great measure, with regard to the motions of our planetary system, and with regard to the rays of light. But supposing that all the phenomena which fall within the reach of our senses were accounted for from general laws of nature justly deduced from experience; that is, supposing natural philosophy brought to its utmost perfection; it does not discover the efficient cause of any one phenomenon in nature. The laws of nature are the rules according to which the effects are produced; but there must be a cause which operates according to these rules. The rules of navigation never navigated a ship. The rules of architecture never built a house.

Natural philosophers, by great attention to the course of nature, have discovered many of her laws, and have very happily applied them to account for many phenomena: but they have never discovered the efficient cause of any one phenomenon: nor do those who have distinct notions of the principles of the science make any such pretence. Upon the theatre of nature we see innumerable effects which require an agent endowed with active power; but the agent is behind the scene. Whether it be the Supreme Cause alone, or a subordinate cause or causes; and if subordinate causes be employed by the Almighty, what their nature, their number, and their different offices may be; are things hidden, for wise reasons no doubt, from the human eye.

CAUSES, in a medical sense, are defined by ancient writers to be those circumstances during the presence of which there is disease. The causes of diseases are various; often obscure, and sometimes totally unknown. The most full and proximate cause is that which, when present, produces a disease, when taken away removes it, and when changed also changes it. There are also remote causes, which physicians have been accustomed to divide into the predisponent and exciting ones. The former are those which only render the body fit for a disease, or which put it into such a state that it will readily receive one. The exciting cause is that which immediately produces the disease in a body already disposed to receive it.

The *predisponent cause* is always inherent in the body itself, though perhaps it originally came from without; but the exciting cause may either come from within or from without.

From the combined action of the predisponent and exciting causes comes the *proximate cause*, which neither of the two, taken singly, is able to produce; seeing neither every exciting cause will produce a disease in every person, nor will every one predisposed to a disease fall into it without an exciting cause. A body predisposed to disease therefore has already declined somewhat from a state of perfect health, although none of its functions are impeded in such a manner that we can truly say the person is diseased. Yet sometimes the predisponent cause, by continuing long, may arrive at such an height, that it alone, without the addition of any exciting cause, may produce a real disease. Of this we have examples in the debility of the simple solids, the mobility of the living solids, and in plethora. The exciting cause also, though it should not be able immediately to bring on a disease; yet if it continues long, will by degrees destroy the strongest constitution, and render it liable to various diseases; because it either produces a predisponent cause, or is converted into it, so that the same thing may sometimes be an exciting cause, sometimes a predisponent one; of which

the inclemencies of the weather, sloth, luxury, &c. are examples.

Diseases, however, seem undoubtedly to have their origin from the very constitution of the animal machine; and hence many diseases are common to every body, when a proper exciting cause occurs, though some people are much more liable to certain diseases than others. Some are hereditary; for as healthy parents naturally produce healthy children, so diseased parents as naturally produce a diseased offspring. Some of these diseases appear in the earliest infancy; others occur equally at all ages; nor are there wanting some which lurk unsuspected even to the latest old age, at last breaking out with the utmost violence on a proper occasion. Some diseases are born with us, even though they have no proper foundation in our constitution, as when a fœtus receives some hurt by an injury done to the mother; while others, neither born with us nor having any foundation in the constitution, are sucked in with the nurse's milk. Many diseases accompany the different stages of life; and hence some are proper to infancy, youth, and old age. Some also are proper to each of the sexes, especially the weaker sex, proceeding, no doubt, from the general constitution of the body, but particularly from the state of the parts subservient to generation. Hence the diseases peculiar to virgins, to menstruating women, to women with child, to lying-in women, to nurses, and to old women. The climate itself, under which people live, produces some diseases; and every climate has a tendency to produce a particular disease, either from its excess of heat or cold, or from the mutability of the weather. An immense number of diseases also may be produced by impure air, or such as is loaded with putrid, marshy, or other noxious vapours. The same thing may happen from corrupted aliment, whether meat or drink; though even the best and most nutritious aliment will hurt, if taken in too great quantity; not to mention poisons, which are endowed with such pernicious qualities, that even when taken in a very small quantity they produce the most grievous diseases, or perhaps even death itself. Lastly, from innumerable accidents and dangers to which mankind are exposed, they frequently come off with broken limbs, wounds, and contusions, sometimes quite incurable; and these misfortunes, though proceeding from an external cause at first, often terminate in internal diseases.

Hitherto we have mentioned only the dangers which come from without; but those are not less, nor fewer in number, which come from within. At every breath, man pours forth a cause of disease both to himself and others. Neither are the effluvia of the lungs alone hurtful: there flows out from every pore of the body a most subtile and poisonous matter, perhaps of a putrescent nature, which being long accumulated, and not allowed to diffuse itself through the air, infects the body with most grievous diseases; nor does it stop here, but produces a contagion which spreads devastation far and wide among mankind. From too much or too little exercise of our animal powers also no small danger ensues. By inactivity either of body or mind, the vigour of both is impaired; nor is the danger much less from too great employment. By moderate use, all the faculties of the mind, as well as all the parts of the body, are improved and strengthened; and here nature has appointed certain limits, so that exercise can neither be too much neglected, nor too much increased, with impunity. Hence those who use violent exercise as well as those who spend their time in sloth and idleness, are equally liable to diseases; but each to diseases of a different kind: and hence also the bad effects of too great or too little employment of the mental powers.

Besides the causes of disease arising from those actions of the body and mind which are in our own power, there are others arising from those which are quite involuntary. Thus, passions of the mind, either when carried to too great excess, or when long continued, equally destroy the health; nay, will even sometimes bring on sudden death. Sleep also, which is of the greatest service in restoring the exhausted strength of the body, proves noxious either by its too great or too little quantity. In the most healthy body, also, many things always require to be evacuated. The retention of these is hurtful, as well as too profuse an evacuation, or the excretion of those things, either spontaneously or artificially, which nature directs to be retained. As the solid parts sometimes become flabby, soft, almost dissolved, and unfit for their proper offices; so the fluids are sometimes inspissated, and formed even into the hardest solid masses. Hence impeded actions of the organs, vehement pain, various and grievous diseases. Lastly, some animals are to be reckoned among the causes of diseases; namely, such as support their life at the expence of others: and these either invade us from without, or take up their residence within the body, gnawing the bowels while the person is yet alive, not only with great danger and distress to the patient, but sometimes even producing death itself.

Galen divided the causes of disease into *external* and *internal*. The external causes of diseases, according to him, are six things, which contribute to the preservation of health when they are well disposed and properly used, but produce a contrary effect when they are imprudently used and ill disposed. These six things are, the air, aliments and drink, motion and rest, sleeping and watching, retention and excretion, and lastly, the passions. All these are called the *procatarctic* or *beginning causes*, because they put in motion the internal

causes; which are of two kinds, the antecedent and the conjunct. The former appears, says Galen, by reasoning; and consists for the most part in a peccancy of the humours, either by plenitude or cacochymy, *i. e.* a bad state of them. When the humours are in too large a quantity, the case is called a plethora; but we must observe, that this word equally denotes too large a quantity of all the humours together, or a redundance of one particular humour which prevails over the rest. According to these principles, there may be a sanguine, a bilious, a pituitous, or a melancholy plenitude: but there is this difference between the sanguine and the three other plenitudes, that the blood, which is the matter of the former, may far surpass the rest: whereas, if any of the three last-mentioned ones do so, the case is no longer called plenitude, but cacochymy; because these humours, abounding more than they ought, corrupt the blood. The causes he also divides into such as are *manifest* and evident, and such as are *latent* and obscure. The first are such as spontaneously come under the cognizance of our senses when they act or produce their effects: the second are not of themselves perceptible, but may be discovered by reasoning: the third sort, *i. e.* such as he calls occult or concealed, cannot be discovered at all. Among this last he places the cause of the hydrophobia.

CAU'SIS, (from the Greek, καυσις); a BURN.

CAUSO'DES FEBRIS, (καυσωδης), i. e. *Causus.* Celsus renders this word by *febris ardens.* See CAUSUS.

CAUSO'MA, (καυσωμα), a term used by Hippocrates. It signifies a burning heat and inflammation.

CAU'STICA, (καυστικα, from καιω, *uro, to burn),* caustics; such substances as, by their violent activity, destroy the texture of the part to which they are applied. These eat away, as we commonly express it, or burn the flesh into an *eschar*, and this, in a little time, falls quite off, and leaves a vacuity in the part. Caustics are of use generally in abscesses and imposthumations, to eat through the integuments, and give vent to the matter; also, to make issues in parts where cutting is difficult or inconvenient. See ESCHAROTICS.

CAUSTIC ALKALI. See ALKALI.

CAUSTIC BARLEY. See CEVADILLA.

CAU'STICUM ANTIMONIA'LE. See ANTIMONIUM MURIATUM.

CAU'STICUM ARSENICA'LE. See ARSENICAL CAUSTIC.

CAU'STICUM COMMU'NE FO'RTIUS. See CALX CUM KALI PURO.

CAU'STICUM LUNA'RE. See ARGENTUM NITRATUM.

CAU'SUS, (from καιω, *uro, to burn);* so called by the Greeks because it is attended with an ardent and burning heat of the whole body. The ancients considered this, together with the extreme heat, and unextinguishable thirst, as characteristic symptoms of this disease. HIPPOCRATES succinctly describes it, *a fever attended with extreme heat, strong thirst, a rough and black tongue, complexion yellowish, and the saliva bilious.* SAUVAGES arranges it under *tritæophya*, the second species (see TRITÆOPHYA); and Dr. CULLEN places it among his examples of tertian remittents (see TERTIANA). Dr. Fowle, in his treatise on fevers in the West Indies, divides them into intermittents, remittents, *ardent fever*, and the malignant or gaol fever. To the diagnostic symptoms of these varieties of fever, he pays particular attention.

"We may observe," says he, "that the ardent fever requires a certain degree of firmness of fibre; it reigns most commonly at that period of the year when the sky is clear; when the atmosphere seems little, if at all, loaded with vapour; and when the heat is great. The objects of its attack are the stout and athletic, young, or middle aged men, or women who in their constitutions and habits nearly resemble them, and those who have lately arrived either from Europe or North America, or from the more mountainous situations in the West Indies themselves. It is prevalent in the dry sandy bays, and is often induced by persons who have been much heated being suddenly exposed to cold.

"The remitting fever, on the contrary, seems to require a previously debilitated body: it is most frequent at those periods of the year, when, the ground having been supersaturated by the rains, the whole atmosphere becomes loaded with noxious vapour. Persons who have lived for some time in the West Indies are by no means free from its power, and women and children suffer severely from it, as do also those who have been debilitated by previous illness or long-continued fatigue. It prevails in the low swampy marshes, in the neighbourhood of lagoons, in uncultivated situations, where the currents of air are impeded, and on the smaller hills which are subject alternately to the swampy vapours, and the cold storms.

"The gaol fever is seldom to be met with except on board of ships or in crowded towns, or in individuals who have been exposed to the contagion of such places.

"This should lead us to a very important point of practice; it should teach us to be minute in our enquiries into the former manner of living of the patient, and also to enquire concerning his previous residence and other circumstances: for where the patient happens to be attacked soon after he comes into the neighbourhood of swampy soils, not having before been exposed to any debilitating causes, we surely may be more free in our evacuations, than in other circumstances. The doctor observes that the mode of attack differs considerably in the three fevers. While the gaol fever is

commonly preceded, for some hours, often for a day or two, by languors and transient alternations of chills and flushes, and the remitting has a *rigor*, generally strong but always sufficiently evident: the ardent fever commonly makes its attack *suddenly* and with *little or no rigor*, and the patient, from being in apparent sound health, is hurried instantly into the midst of disease. The prostration of strength also, though very great both in the remitting and typhous fever, yet bears no proportion to that in the ardent: the pain in the head, back, and limbs, is considerable in all, but in the ardent there is most commonly a violent pain in the middle of the thighs. The pain also of the head is different in the various fevers: in the ardent, it is principally fixed over the orbit of each eye, while there is only a dull heavy pain over the rest of the head; in the remitting, the pain is violent and continued over the whole head; while in the gaol fever it seems rather to be a succession of pulsations, giving an idea to the patient that his head is forcibly opening and shutting. There is little vomiting, except just in the early attack of gaol fever; but in both the others, it is a troublesome and dangerous symptom: in the remitting, there is generally a quantity of bile thrown up, frequently of a green colour, but this seldom or never happens in the ardent. So constantly indeed is this the case, that where bile is vomited up, and there has been sensible *rigor*, we can have scarcely any doubt in pronouncing the fever not to be of the ardent type: and there is also in the latter a sensation of burning at the pit of the stomach.

The countenance in the gaol fever is commonly, although slightly, suffused, yet of a dirtyish hue, and by no means tumid; and there is commonly violent pulsation of the carotid arteries. In the remitting, after the hot fit is formed, the suffusion is great, but the tumor by no means so evident, particularly about the fauces and neck, as in the ardent. The mode of speaking is very different: in this, it is confused and thick; in the remitting, it varies only from health in a quickness, owing to the anxiety of the patient, not to any particular debility of the organs of speech; and in the gaol fever it is generally a quickness of speech for a word or two, rather as if from impatience at being disturbed, or else it is plaintive and querulous. Neither in the remitting nor typhus has the patient any of that appearance as of intoxication, which is frequently to be observed in the ardent fever.

The tongue in typhus is generally very tremulous when put out: it is from the beginning furred, and soon becomes dry and chapped; and, towards the latter stages of the disease, the tongue and lips are covered with black and loose saburra, floating like cobwebs, or they have a number of aphthæ over their surface. In the remitting, the tongue is furred, but in no degree; and, as the disease advances, this fur becomes brown, but there is in general some moisture on it to the last. In the ardent fever the tongue has no fur upon it; on the contrary, we may call it morbidly clean: it is rather moist, and of a bright red colour: as the disease advances, it sometimes becomes dry, at others not so, but always continues clean. The thirst is not so great as we might be led to expect in this fever, from the vehemence of the symptoms, neither is it in any proportion to what is felt in the others. In this fever also, while the prostration of strength is very great, the vomiting, burning heat of the stomach, and restlessness, are violently urgent, and the heat of the skin intense. The pulse varies very inconsiderably, either in strength or quickness, from its natural state, but in the other fevers, it is amongst the first symptoms to show a derangement of the system.

The delirium is very different also: in the ardent fever, it is of the most fierce kind. The patient generally imagines himself in the presence of his most bitter enemies, who are either attacking him, or whom he is endeavouring to attack; the eye-balls are strained, the whole countenance puts on the most terrific aspect, and it often requires two or three persons to hold him in his bed. The delirium in the remitting is seldom so fierce; it is generally mild, the imagination of the patient busying itself with his former occupations and pursuits: while that of typhus seems scarcely to amount to more than a want of power of attention in the sick person to any thing about him; for during the time he is uttering the most incoherent nonsense, if he be roused, he gives a rational answer, but immediately relapses into his incoherent fit.

Dr. Fowle considers these the symptoms which are most dissimilar in the different fevers; and has purposely omitted the yellowness of the skin, the black vomit, and the hæmorrhages from different parts of the body, as he says he has seen them occur in every species of fever in the tropical climates.

CAUSUS, ENDEMIAL; the name given by Dr. Moseley to the yellow fever of the West Indies. See Yellow Fever. The generality of the French writers say that it was brought directly from Siam, in a merchant ship, and communicated to the people of Martinique, whence the contagion was carried to St. Domingo, but that the sailors were the only people attacked by it, whence it was also called la fievre matelotter.

This account of the origin of the disease, Dr. Moseley says, has been universally credited by these writers, who have not been at the trouble to consider, that a disease brought from Siam in the East Indies, in a similar latitude to the West-Indian islands, would be most likely to affect the natives, living in a climate similar to that in which the disease originated, rather than Europeans of so

different a temperament of body. But the fact is, that this disease never attacks either white or black natives of hot climates; neither was it brought from Siam: and though it is possible, from the heat of the climate, that it may frequently appear there, or in any other tropical country (though Barrere says it is unknown at Cayenne), no history of that country mentions such a disease. The Spaniards call it *vomito prieto*, or the black vomiting, from its most direful symptom. By this disease their galleons sometimes lose the principal part of their men, in the West Indies, particularly at Porto Bello and Carthagena.

"That this disease is a species of the καυσος of Hippocrates, Aretæus, and Galen," says Dr. Moseley, "that is, the *febris ardens* or *causus*, as it is called, I think there can be no doubt;—aggravated by climate—incidental only to the gross, inflammatory, and plethoric—at any season of the year—and totally different from the remittent bilious fever, to which all habits of body are subject, in hot climates, particularly after rains, and in the fall of the year.

"The causus, the most ardent fever in temperate climates, as described by the fathers of physic, is a disease seldom seen in the northern parts of Europe; and never attended with that violence of symptoms, which accompanies the same description of disease in hot climates. And whether in latitudes so mild as those of Spain, Italy, Greece, and the Archipelago islands, the causus has ever been attended with black vomiting, as in the West Indies, I cannot tell. Lommius mentions the vomiting of blood, and voiding black liquid stools, and black urine. Critical, and symptomatical yellowness of the skin, in the causus, is enumerated among the symptoms by Hippocrates; and the accurate Lommius particularly mentions the danger of that appearance before the seventh day; *grave esse periculum significatur ubi aurigo ante septimum diem oritur.*

"The affinity of the symptoms, progress, and termination of a causus, in Europe, to those of this fever of the West Indies, excepting the black vomiting, leaves no room to doubt that the difference of climate constitutes all the difference that is found between them. The black tongue is always mentioned as a symptom in the causus; of which appearance Hippocrates has made a judicious discrimination, that all other writers have omitted. The tongue, he says, *primum, flava est; sed procedente tempore nigrescit. Si igitur per initia nigrescat, celeriores sunt liberationes; si vero postea, tardiores.* Which is exactly the case in the yellow fever. Trallian says, in the genuine causus the tongue is black, but not in the spurious causus; yet he considers the latter as the most dangerous disease: and Lommius speaks of the danger of the tongue being first dry, then rough, then black and foul.

"Hippocrates mentions, in other places, some circumstances not enumerated in his description of the causus, which we find correspond with the yellow fever; and are convincing proofs that he had seen fevers attended with a vomiting of black blood (what the ancients sometimes termed *black bile)*, as in his prognostics, he often mentions the fatality of that symptom; and some that were equally rapid with this disease. Of the causus, he says, *febris ardens fit, quum resiccatæ venulæ tempore æstivo, acres et biliosos ichoras ad se attraxerint: ac febris multa detinet, corpusque quemadmodum ab ossecariâ lassitudine affectum, laborat, doletque. Fit plerumque tum ex longo itinere, tum longa siti, quum arefactæ venulæ acres calidasque fluxiones ad se attraxerint. Fit vero lingua aspera, et sicca, valdeque nigra; partiumque ventris morsu dolet; dejectiones tum liquidæ, tum pallidæ fiunt; sitis adest vehemens, et vigiliæ, atque interdum mentis alienationes.* He observes, also, *febris et sitis vehemens afficit, lingua aspera et nigra, spiritus sanè calore redditur, color aliquantulum biliosus fit, et sputa biliosa. Atque ægro exteriora frigida sunt, interiora verò admodum calent.*

"He says there is another species of causus, in which, *alvus subducitur; siti scatet; lingua aspera, sicca, salsa; urinæ suppressio; vigilia; extrema refrigerata.*

"Of the two species of this disease, mentioned by Hippocrates, Galen denominates one a genuine and the other a spurious causus; one was supposed to proceed from bile, the other from phlegm. In the former, the tongue was black; in the latter not. Trallian, and other writers, have adopted this distinction. Galen also remarks, that the coldness of the extremities is a symptom only of the spurious causus, and then only when the fever is malignant; but that in the genuine, bilious, and burning causus, the heat of the body is extended to the extremities."

But notwithstanding the endemial causus, or yellow fever, appears from the nature of the disease to be indigenous to the torrid zone, there was no notice taken of it in the West Indies until nearly two centuries had elapsed from the first discovery of that country.

Ulloa, in his Voyage to South America, says, "the *vomito prieto*, was unknown at Cathagena, and all along the coast, till the years 1729 and 1730. In 1729 Don Domingo Justiniani, commodore of the Guarda Costas, lost so considerable a part of his ships' companies at Santa Martha, that the survivors were stricken with astonishment and horror at the havock made among their comrades. In 1730, when the galleons under Don Manuel Lopez Pintado came to Carthagena, the seamen were seized with the same dreadful mortality; and so sudden were the attacks of the disease, that persons walking about one day, were the next carried to their graves. Unhappily, after all the

experiments of the surgeons of the galleons and physicians of the country, no good method of treating the disease was discovered; no specific for curing it, nor preservative against it."

Warren, although he lived at Barbadoes in 1739, supposes it never appeared in that island until about the year 1721, and that it was then brought from Martinique, in the Lynn man-of-war. He says, the second appearance of it there was in 1733, and that it then came also from Martinique. He undertakes to show, that it is a disease of Asiatic extract, and says, that 'a Provençale fleet arrived at Port St. Pierre in Martinique from Marseilles, on board of which were several bales of Levant goods, which were taken in at Marseilles, from a ship just arrived from St. Jean d'Acre (probably the Ptolemais of the ancients). Upon opening these bales of goods at Port St. Pierre, this distemper immediately showed itself; many of the people were instantly seized, some died almost suddenly, others in a few days, and some lingered longer; and the contagion, still spreading, made great havock at the beginning.'—He says he had this account from Mr. Nelson, an English surgeon, who was seized with the disease in Martinique, and died of it a few days after his arrival at Barbadoes. 'It is probable,' says he, 'that the same fever, or one of very near resemblance and affinity, may first have been carried among the American Spaniards (among whom it is now endemic), in somewhat a like manner; and that possibly some peculiar qualities in the air and climate might have fostered and maintained it there ever since.' And yet, he says, seafaring people and new-comers are most obnoxious to it, 'such as had purer blood, and probably less adust than that of the natives; or of those whose constitutions had been, for many years, fitted and habituated to the climate.'

How a climate should foster a disease, and a contagious one, and the natives of that climate be exempt from it, Dr. Moseley says, he cannot comprehend: the whole story indeed he considers fabulous, and therefore declines all reasoning on it.

"Towne," says the doctor, "who practised in Barbadoes, and who wrote on the diseases of that island in 1726, takes not the least notice of this chimerical origin of the yellow fever, but considers it as an endemial disease in the West Indies; to which Europeans are subject on their first arrival: and Hillary, who wrote long after both of them, in 1759, says, it is 'indigenous to the West-Indian islands, and that it most commonly seizes strangers, especially those who come from a colder or more temperate climate.' He says, 'a better enquiry would have informed Warren, that this fever had appeared in Barbadoes, and the other West-Indian islands, many years before; for several judicious practitioners who were then, and now are living (about the year 1760), whose business was visiting the sick, some of them almost eighty years of age, remember to have seen this fever frequently in this island, not only many years before that time, but many years before that learned gentleman came to it.'

Dr. Moseley farther observes, that, in the endemial causus of the West Indies, some of those symptoms which have given names to the disease, are now but seldom seen, unless when the patient has applied for advice too late, or where improper advice has been unfortunately pursued: nor did he ever see, or hear of, an instance, which Lind supposes may happen, that "the black vomit may attack a man, when newly arrived there, without any previous complaint;" nor of this disease coming on with "an uneasy itching sensation commonly in the legs, and upon pulling down the stockings, streams of thin dissolved blood followed, a ghastly yellow colour quickly diffused itself over the whole body, &c." The former, unquestionably, is a symptom of the endemial causus, though not at that period of it which Dr. Lind suggests; but the latter is no symptom of this disease, nor scarcely of any other. That the black vomiting appears earlier in some cases than in others, is certain; and the earlier it appears, the greater certainty there is in the prognostic of immediate death.

Towne calls it, febris ardens biliosa; Warren, a malignant fever; and Hillary, a putrid bilious fever. Dr. Moseley justly observes, that, the various names given to this disease, improperly taken from its ultimate, and not from its primary symptoms, have occasioned great difficulties to young practitioners, and to strangers in the West Indies: and this confusion of terms, as might be expected, has often been productive of fatal consequences in practice.

After noticing the contests which agitated the writers on the endemial causus respecting the propriety of terming it bilious, Dr. Moseley thinks he may venture to assert, that none of them have been able to decide whether bile is the cause or the consequence of the disease in question. He then proceeds to observe on the eventual importance of giving true and appropriate names to diseases of so fatal a description. He says, he has adopted the epithet *yellow* in compliance with custom; but he even distrusts that name; as the inexperienced may be looking out for that appearance, and not find, until it is too late, the disease he has to contend with. Indeed the yellowness of the skin, he says, like the black vomiting, is not an invariable symptom of this fever;—those who are fortunate enough to recover, seldom have it; and many die without its appearance. Besides, the yellowness alone, leads to nothing certain; it may arise from a harmless suffusion of bile, as well as from a gangrenous state of the blood. Dr. Fowle has observed that persons attacked with fever, in almost any situation, very generally became yellow; which

soon led him to conceive it merely a concomitant symptom, and by no means such as could be sufficiently characteristic of any one fever, to give it a particular denomination. It also led him to discover the cause of the variety of symptoms attributed by different authors to the yellow fever, and to account for successful methods of cure which were often diametrically opposite to each other.

Dr. Moseley very properly observes, that the term we should use to denote a disease "*should agree with some circumstances that characterize its attack, or first appearance.*" The circumstances which characterize this, he says, agree with no fever, but the causus; nor is this disease any more entitled to the name of *putrid*, than the small-pox, or any other acute disease; which may, after it has passed its inflammatory period, terminate with putrid symptoms. "The truth is," says Dr. Moseley "that this disease is in the highest degree possible, an *inflammatory* one; accompanied with such symptoms, in a greater extent, as attend all inflammatory fever, and most strikingly the reverse of any disease that is putrid, or of one continued exacerbation. It obeys no particular season of the year; and attacks also such people, and under such circumstances, as are seldom the objects of putrid diseases."

In the history of this fever, a multitude besides those whom the Dr. names, have tried their strength, in vain; having done nothing more than copy those originals: with the addition, perhaps, of some trifling medicine, or unimportant observation. But the symptoms, he says, have always been better described than the disease has been treated.

CAUTERY, (καυτηριον; from καιω, *to burn*). Cauteries were divided by the ancients into *actual* and *potential;* but the term is now given only to the red hot iron, or *actual cautery*. This was formerly the only means of preventing hæmorrhage from divided arteries, till the invention of the ligature (see LIGATURE). It was also used in diseases with the same view as we employ a blister. *Potential Cautery* was the name by which *kali purum*, or *potassa*, was distinguished, in the former Dispensatories of Edinburgh.

CA'VA (from *cavus*, hollow): the name of the great veinous trunk, which carries back, to the right auricle of the heart, the blood conveyed by the aorta to all parts of the body, except what goes by the arteriæ coronariæ. It receives all this blood from the arterial ramifications in part directly, and in part circuitously.

The vena portæ receives the blood carried to the loose viscera of the abdomen by the cæliac artery, and the two mesenteries; and conveys it to the vena hepatica, and from thence to the vena cava. The pulmonary veins convey to the left auricle of the heart, the blood carried to the lungs by the pulmonary artery. To these two others might be added, viz. those which belong particularly to the heart, and to its auricles, and the sinuses of the dura mater.

In describing the general course of the veins, we may either begin by their extremities in all the parts of the body, and end by the trunks carried all the way to the heart, according to the course of the blood; or we may begin by the great trunks, and end by the ramifications and capillary extremities, according to their several divisions and subdivisions. This last method has been chosen by Winslow; and followed by Mr. Fyffe in giving a general description. But in pursuing the particular rami and ramifications, he thinks the other method the most natural, and it is also that which is usually preferred by the professors of anatomy in the university of Edinburgh. That gentleman, therefore, in describing the branches of the vena cava, adopts the first method, and, reversing Winslow's, traces them, according to the course of the blood, from their extremities to the great trunks and to the heart.

The vena cava is generally spoken of as if it were but one vein at its origin, or had, in fact, but one common trunk; whereas it goes out from the right auricle of the heart by *two* large *separate trunks*, in a direction almost precisely opposite to each other, the one running upward, called *vena cava superior;* the other downward, called *vena cava inferior*. Nevertheless, it may truly be said, that these two veins have a sort of continuity, or a small portion of a common trunk, fixed to the edges of the right auricle; as if three quarters of the circumference of a large straight tube were cut off, and the edges of a small bladder applied to the edges of the opening thus made in the tube.

The right auricle of the heart may also be looked upon as a muscular trunk common to these two large veins, and may be called the *sinus* of the vena cava; but, in this respect, the name of *sinus pulmonaris* agrees still better to the left auricle.

The vena cava superior is distributed chiefly to the thorax, head, and upper extremities, and but very little to the parts below the diaphragm. The vena cava inferior is distributed chiefly to the abdomen and lower extremities, and but very little to the parts situated above the diaphragm.

The ancients called the superior vena cava, *ascendens;* and the inferior, *descendens;* having regard only to the great tubes, and to their division into trunks and branches. Several moderns have retained these names, but in a contrary signification, to accommodate them to the motion of the blood, which, in fact, descends by the cava superior, and ascends by the cava inferior. But, to prevent any mistakes that may happen in reports made of wounds or other diseases, and of what is observed in opening dead bodies, and in other cases of importance, Mr. Fyffe says, it is best to retain the

distinction of the vena cava superior and inferior.

From the trunks of each of these two veins, there proceeds a certain number of principal or capital branches, which are afterwards ramified in different manners. Each trunk terminates afterwards by a bifurcation or a division into two subordinate trunks, each of which gives off other principal branches, ending in a great number of ramifications.

They have likewise this in common to them with the arteries, that the greatest part of the capital branches are in pairs; as well as the subordinate trunks. The ramifications of each subaltern trunk, taken by itself, are in uneven numbers; but they make even numbers, with those of the other like trunk. The vena azygos and some other small veins, of which hereafter, are exceptions to this general rule.

Each of these veins have branches that bear proper names, under which they will be described. We shall here give a general idea of their distribution, and an enumeration of their principal ramifications, but shall say nothing of the *venæ coronariæ cordis*, because these are not immediately joined to any other vein, as will be seen in describing the contents of the thorax.

1. The *superior vena cava* runs up from the right auricle of the heart, almost in a direct course for about two fingers breadth, lying within the pericardium, in the right side of the trunk of the aorta, but a little more anteriorly. As it goes out of the pericardium, it is inclined a little to the left hand, and then runs up about an inch, that is, as high as the cartilage of the first true rib, and a little higher than the curvature of the aorta. At this place it bifurcates into two large branches or subordinate trunks, one of which runs toward the left, the other toward the right side.

These two branches are named *venæ subclaviæ*, as lying behind, and, in some measure, under the clavicles, both in the same manner. They are of unequal lengths, because the trunk of the vena cava does not lie in the middle of the thorax, but toward the right side, where the left subclavian arises as well as the right; and consequently the left is the longest.

The trunk of the vena cava superior, from the point where it leaves the pericardium to the bifurcation, sends out anteriorly several small branches, which sometimes arise separately, and sometimes by small common trunks. These branches are the *vena mediastina*, *pericardia*, *diaphragmatica superior*, *thymica*, *mammaria interna*, and *trachealis;* the last of which go out sometimes behind the bifurcation. All these small branches from the trunk of the cava superior are termed *dextræ;* and their fellows on the other side, called *sinistræ*, do not arise from the trunk, because of its lateral situation, but from the left subclavian.

Posteriorly, a little above the pericardium, the trunk of the vena cava superior sends out a large branch, called *vena azygos*, or *vena sine pari*, which runs down on the right side of the bodies of the vertebræ dorsi, almost to the diaphragm; giving off most of the venæ intercostales and lumbares superiores.

The *venæ subclaviæ* run laterally or toward each side; and terminate as they go out of the thorax, between the first rib and clavicula, immediately before the anterior insertion of the musculus scalenus. The *right subclavian*, which is the shortest of the two, commonly sends out four capital branches; the jugularis externa, jugularis interna, vertebralis, and axillaris; which last is rather a continuation than a branch of the subclavia. The *left subclavian* being longer than the right, for the reason already given, gives off, first of all, the small veins on the left side, answering those on the right side that come from the trunk of the superior cava, viz. the *mediastina*, *pericardia*, *diaphragmatica superior*, *thymica*, *mammaria interna*, and *trachealis*.

Immediately next to these small veins, it detaches another small branch called *intercostalis superior sinistra;* and then four large branches like those from the right subclavian, viz. the *jugularis externa*, *jugularis interna*, *vertebralis*, and *axillaris;* which are all termed *sinistræ*. The former are distributed chiefly to the outer parts of the throat, neck, and head; and send a small vein to the arm, named *cephalica*, which assists in forming a large one of the same name. The *internal jugular veins* go to the internal parts of the neck and head, communicating with the sinuses of the dura mater, and in several places with the external jugular veins. The *vertebral veins* pass through the holes in the transverse apophyses of the vertebræ of the neck, sending branches to the neck and occiput. They form the sinus venales of these vertebræ, and communicate with the sinuses of the dura mater. The *axillary veins* are continuations of the subclaviæ, from where these leave the thorax to the axillæ. They produce the mammariæ internæ, thoracicæ, scapulares or humerales, and a branch to each arm; which, together with that from the external jugularis, forms the vena cephalica. Afterwards the axillary vein terminates in the principal vein of the arm, called *basilica;* which, together with the cephalica, is distributed by numerous ramifications to all the parts of the arm, fore-arm, and hand.

2. We now come to speak of the *vena cava inferior*. The portion of this vein which is contained in the pericardium, is very small; scarcely the twelfth part of an inch on the fore-part. From thence it immediately perforates the diaphragm, to which it gives the venæ diaphragmaticæ inferiores

or phrenicæ. It passes next behind the liver, through the great sinus of that viscus, to which it furnishes several branches, termed *venæ hepaticæ*. In this course it inclines a little toward the spina dorsi and aorta inferior; the trunk and ramifications of which it afterwards accompanies in the abdomen, all the way to the os sacrum; the arteria cæliaca and the two mesentericæ only excepted.

Thus the vena cava inferior sends out on each side, corresponding with the branches of the aorta, the *venæ adiposæ*, *renales*, *spermaticæ*, *lumbares*, and *sacræ*. Having reached to the os sacrum it loses the name of *cava*; for, terminating by a bifurcation, like that of the aorta descendens, it forms the two *venæ iliacæ*.

These veins having given off the hypogastricæ, with all their ramifications, to the viscera of the pelvis, and to some other external and internal neighbouring parts, pass out of the abdomen, under the ligamentum Fallopii, and there they take the name of *venæ crurales*. Each crural vein sends off numerous ramifications to the lower extremity; besides the vena saphena, which goes out near the origin of the cruralis, and, running along the whole extremity, detaches many ramifications all the way to the foot.

CAVIA'RE, an insect. See Axayacatl.

CAVIA'RIUM, caviare, a kind of food lately introduced into Britain. It is made of the hard roes of sturgeon, formed into small cakes, about an inch thick and three or four inches broad. The method of making it is, by taking out of the spawn all the fibres or strings, then washing it in white wine or vinegar, and spreading it on a table. It is then salted and pressed in a fine bag; after which it is cased up in a vessel with a hole at the bottom, that if any moisture is left it may run out. This kind of food is in great request among the Muscovites, on account of their three lents, which they keep with a superstitious exactness: hence the Italians settled at Moscow carry on a very great trade in this commodity throughout that empire, there being a prodigious quantity of sturgeon taken at the mouth of the Wolga and other rivers which fall into the Caspian sea. A pretty large quantity of this commodity is also consumed in Italy and France. They get the caviare from Archangel, but commonly buy it at second hand of the English and Dutch. According to Savary, the best caviare brought from Muscovy is prepared from the belluga, a fish eight or ten feet long, caught in the Caspian sea, which is much preferable to that made of the spawn of sturgeon. A kind of caviare, or rather sausage, is also made from the spawn of some other fishes; particularly a sort of mullet caught in the Mediterranean. It is called *Botargo*.

CAYENNE PEPPER. See Piper indicum.

CEANOTHUS, New Jersey tea-tree; a genus in Linnæus's botany. He enumerates three species. It is also named *ceanthus*.

CEA'SMUS, (κεασμα, from κεω, *to split* or *divide*); a fissure or fragment.

CECRO'PIA, the trumpet-tree, or the snake-wood-tree; a genus in Linnæus's botany. There is but one species.

CEDAR. See Cedrinum Lignum.

CEDRE'LA, Barbadoes cedar-tree; a genus in Linnæus's botany. He enumerates one species.

CE'DRIA, a name for the pitch, or the resin, of the great cedar-tree. It is formed of the crude tears of the cedar. Some writers confound this with the *cedrelæum*, or oil of cedar, but erroneously.

CEDRI'NUM LI'GNUM; the wood of the cedar of Lebanus. It is the *Pinus cedrus*, Linn.

CE'DRIS, the fruit of the great cedar-tree.

CE'DRIUM, i. e. Cedria. It is also a name for common tar in the old writings.

CE'DRO, the citron-tree.

CEDROME'LA, the fruit of the citron-tree.

CEDRONE'LLA, Turkey-baum.

CEDRO'STIS, i. e. *Bryonia Alba*. See Bryonia.

CE'DRUS, the cedar of Lebanon; the *Pinus Cedrus*, Linn. See Cedrum.

CE'DRUS AMERICA'NA, i. e. *Arbor Vitæ*. See Arbor Vitæ.

CE'DRUS BACCI'FERA. See Sabina.

CEI'BA, a species of bombax. See Bombax.

CELANDINE. See Chelidonium majus.

CELA'STRUS, staff-tree; a genus in Linnæus's botany. He enumerates sixteen species, one of which, the *scandens* is employed in Senegal by the negroes. The powder of the root is reckoned a specific against the gonorrhœa, which it is said to cure in eight or sometimes in three days. An infusion of the bark of a species of staff-tree, which grows in the isle of France, is said to possess the same virtues.

CE'LE, (from the Gr. κηλη); a tumor caused by the protrusion of any soft part. Hence the compound terms hydro*cele*, bubono*cele*, &c.

CE'LERI, or celery; the English name for a variety of the *apium graveolens*. See Apium. Of this very common esculent vegetable, Dr. Cullen says: "Celeri is never employed as an alimentary matter but when it is deprived of its peculiar juice, by being *blanched:* and in this state, it is on the footing of the other blanched plants, an alimentary matter sufficiently mild and perfectly safe. With respect to it, however, in this state it is, to be remarked, that it is never so entirely deprived of its acrimony as not to retain more taste, and a more agreeable taste, than the other blanched plants; and, upon this account, it is more generally used at table. Although even in its blanched state, re-

taining a little acrimony, if it be very well boiled in water or broth, it becomes a tender mucilaginous, and therefore a nutritious, substance."

CE'LERI, WILD; the *apium antarcticum* Linn. This plant was found in considerable quantities by Mr. Banks and Dr. Solander, on the coast of Terra del Fuego. It is like the garden celeri in the colour and disposition of its flowers, but the leaves are of a deeper green. The taste is between that of celeri and parsley. It is a very useful ingredient in the soup for seamen, because of its antiscorbutic quality. See APIUM.

CELERIAC, also called *turnep-rooted celery;* a species of APIUM.

CELIAC ARTERY and VEINS. See CŒLIACA, and ARTERIES and VEINS.

CELIBACY; the state of unmarried persons. Scaliger derives the word from the Greek κοιτη, "bed," and λειπω. *linquo*, "I leave:" others say it is formed from *cœli beatitudo*, q. d. the blessedness of heaven. The ancient Romans used all means imaginable to discourage celibacy. Nothing was more usual than for the censors to impose a fine on bachelors. Dionysius Halicarnassensis mentions an ancient constitution whereby all persons of full age were obliged to marry. But the first law of that kind, of which we have any certainty, is that under Augustus, called *lex Julia de maritandis ordinibus.* Celibacy, being an unnatural state, is amongst the causes which gradually incline the body to a morbid condition. In women this is peculiarly the case, as laying the foundation of diseases of the breast and uterus, in the latter periods of life. See CANCER.

CE'LLA TU'RCICA. See SELLA TURCICA.

CELLS, in anatomy, little bags, or bladders, in which the fluids are lodged, called *loculi*, *cellulæ*, &c. Thus the *cellulæ adiposæ* are the little cells containing the fat. See CELLULAR MEMBRANE.

CELLS, in botany, the hollow places between the partitions in the pods, husks, and other seed-vessels of plants: according as there is one, two, three, &c. of these cells, the vessel is said to be unilocular, bilocular, trilocular, &c.

CE'LLULÆ MASTOIDÆ'Æ: these are very irregular cavities in the substance of the mastoid apophysis, which communicate with each other, and have a common opening towards the inside, and a little above the posterior edge of the orbicular groove. The mastoid opening is opposite to the small aperture of the Eustachian tube, but situated a little higher up.

CELLULAR MEMBRANE; *tela cellulosa*, *panniculus adiposus*, *reticularis membrana;* called by the French *tissue cellulaire*, *tissue muqueux*, and *l'organe cellulaire.* This membrane is of the greatest extent, and of the utmost consequence in the structure of every animal body; for it both enfolds and connects every filament; indeed, some go the length of supposing, that it is the very constituent of most, if not all, the solid parts. Experiments prove, that all membranes, without exception, and the vessels, which are hollow membranes, the parenchymatous substance of the viscera, ligaments, and even some parts of the bones, either are, or have been, cellular membrane. The cellular membrane, by being compacted in different degrees of firmness, forms these solids. Air introduced under the skin diffuses itself through all the surface of the body, penetrates into the interstices of the muscles; and Haller asserts, that even the vitreous humour of the eye has received the flatus of an emphysema; but this latter supposition is hardly admissible.

Some anatomists describe the cellular membrane not as one, but as a congeries of many membranous laminæ joined irregularly to each other at different distances, so as to form numerous interstices of different capacities, and which communicate with each other. These interstices they call cellulæ, and the substance made of them *cellular substance.* But generally, and indeed most properly, it is considered as being of two kinds, viz. reticular and adipose; and is described as a composition of ductile membranes for the lodgment of oil, connected by a sort of net-work. In some parts, its substance is merely a net-work of slender fibres, and small membranes which give it ductility and looseness; for instance, under the skin of the penis and scrotum. In other parts, it is more or less loaded with oil, and is less porous or spongy in its substance. Dr. Hunter uses the term *cellular* as the generical name, and the terms reticular and adipose for expressing the two species. He also observes, that the reticular part is evidently dispersed through the whole body, except, perhaps, in the substance of the bones, of the brain, and in the humours of the eye; that it is found in a much greater degree in the belly of a muscle than in the tendon, in which it is scarcely discerned. And he is of opinion, that the *adipose membrane* is composed of two kinds of cells; viz. the reticular, which communicate with each other; and adipose, which are distinct, and are the reservoirs of the animal oil, or a white granulated matter, capable only of being fused by heat; the cells of which, containing it, are called *sacculi adiposi.* He urges, as a proof of his opinion, that the water in an anasarca goes downward, while we are in an erect posture, but the oil does not. The oil is supposed to be secreted by the small arteries, and occasionally absorbed into the circulation. Though Dr. Hunter thinks, that wherever there is fat in an animal, there is a particular glandular apparatus superadded to the reticular membrane, consisting of vesicles, or bags, for lodging the animal oil, as well as vessels fitted for its secretion. See FAT.

But whether the cellular membrane be the basis of all the organised and vascular parts of the body or not, Dr. Hunter has at least proved, that the

most simple parts of it are vascular; that the callus which unites a fractured bone is itself bone, and also vascular; that the morbid adhesions between the lungs, &c. and their adjacent parts, are vascular, and that a cicatrix in the skin is vascular. Whence he infers, that all the solids are organised, and that, whether lengthened or renewed, they shoot in a vascular form.

The great importance of this cellular substance will be evident to all who consider, that from it alone proceeds the due firmness and stability of all the arteries, nerves, and muscular fibres, and consequently of all the flesh and viscera formed of these: but even the figures of the parts, their just length, cavities, curvatures, and flexures, depend entirely on the cellular membrane, being in some places of a laxer, and in others of a denser fabric; for, when divided, every part is lengthened and collapses. Of this substance, with vessels, nerves, muscular and tendinous fibres, (a great part of which are however formed of it), all the viscera, all the muscles, glands, ligaments, and capsules, are composed; on it alone, and its different length, tension, quantity or proportion, the diversity of our glands and viscera depends; and, lastly, it certainly constitutes by far the greatest part of the body itself, if indeed the whole be not formed of cellular filaments of this kind.

It possesses a contractile power, different from irritability, which, though not demonstrable by experiments, disposes the cellular fibre to shorten itself, though for the most part slowly, after having been stretched. This power, excited by cold, renders the skin rigid; raises the hairs; draws up the scrotum; and, after gestation, restores the skin of the abdomen, and the uterus, to their former size. The same force, by a gentle but continual contraction, promotes the secretion of fat, of the liquors of the subcutaneous and other glands, and of pus: in the veins and receptacles, it resists dilatation; and, when that is taken off, it regains its former shortness. In the fœtus, this gentle force is among the principal causes of the changes that happen to the body.

CELO'SIA, COCK'S-COMB AMARANTH; a genus in Linnæus's botany. He enumerates eleven species, and five varieties.

CELOSIOI'DES; a species of IRESINE.

CE'LSIA; a genus in Linnæus's botany. There are three species.

CE'LSII, Upsalian bryum; a species of BRYUM.

CELSUS, (Aurelius Cornelius); one of the most celebrated medical writers of antiquity. Most authors agree that he lived in the time of Tiberius, but his country is uncertain. It is even disputed whether or not he was a professed physician. Certain it is, however, that his books on medicine are the most valuable of all the ancients next to those of Hippocrates. From the latter, indeed, he has taken so much, as to acquire the name of the *Latin Hippocrates;* but he has not attached himself to him so closely as to reject the assistance of other authors. In many particulars he has preferred Asclepiades. With him he laughs at the critical days of Hippocrates, and ascribes the invention of them to a foolish and superstitious attachment to the Pythagorean doctrine of numbers. He also rejected the doctrine of Hippocrates with regard to venesection, of which he made a much more general use; but did not take away so much at a time, thinking it much better to repeat the operation than weaken the patient by too great an evacuation at one time. He used cupping also much more frequently, and differed from him with regard to purgatives. In the beginning of disorders, he said, the patients ought to endure hunger and thirst; but afterwards they were to be nourished with good aliments; of which, however, they were not to take too much, nor fill themselves all of a sudden, after having fasted. He does not specify how long the patient ought to practise abstinence; but affirms, that in this particular it is necessary to have a regard to the disease, the patient, the season, the climate, and other circumstances of a like nature.

The signs drawn from the pulse he looked on to be very precarious and uncertain. "Some," says he, "lay great stress upon the beating of the veins [the arteries]; which is a deceitful circumstance, since that beating is slow or quick, and varies very much, according to the age, sex, and constitution, of the patient. It even sometimes happens that the pulse is weak and languid when the stomach is disordered, or in the beginning of a fever, though in other respects the body be in a good state: so that we might, in this latter case, be induced to believe, that a man is very weak, when he is just entering into a violent paroxysm, has strength enough left, and may be easily recovered from it. On the contrary, the pulse is often high, and in a violent commotion, when one has been exposed to the sun, or comes out of a bath, or from using exercise; or when one is under the influence of anger, fear, or any other passion. Besides, the pulse is easily changed by the arrival of the physician, in consequence of the patient's anxiety to know what judgment he will pass upon his case. To prevent this, the physician must not feel the patient's pulse on his first arrival: he must sit down by him, assume a cheerful air, inform himself of his condition; and, if he is under any dread, endeavour to remove it by encouraging discourse: after which he may examine the beating of the artery. This, nevertheless, does not hinder us from concluding, that, if the sight of the physician alone can produce so remarkable a change in the pulse, a thousand other causes may produce the same effect." But although Celsus thought for himself,

and in not a few particulars differed from his predecessors, yet in his writings, which are not only still preserved, but have gone through almost innumerable editions, we have a compendious view of the practice of almost all his predecessors: and he treats of the healing art in all its branches, whether performed *manu*, *victu*, *vel medicamentis*. His writings, therefore, will naturally be had recourse to by every one who wishes either to become acquainted with the practice of the ancients prior to the fall of the Roman empire, or to read medical Latin in its greatest purity.

There is a passage in one of his books which deserves to be quoted, because it shows his generous and enlarged way of thinking, and because it may help to cure that obstinacy and bigotry which is so natural to the pride of the human heart. Hippocrates, as knowing and as skilful a physician as he was, once took a fracture of the skull for the natural suture, and was afterwards so ingenuous as to confess his mistake, and even to leave it upon record. "This," says Celsus, "was acting like a truly great man. Little geniuses, conscious to themselves that they have nothing to spare, cannot bear the least diminution of their prerogative, nor suffer themselves to depart from any opinion they have once embraced, how false and pernicious soever that opinion may be; while the man of real abilities is always ready to make a frank acknowledgment of his errors, and especially in a profession, where it is of importance to posterity to record the truth."

CE'LTIS, the NETTLE-TREE; a genus in Linnæus's botany. He enumerates three species.

CE'MBRA, mountain cembro-pine; a species of PINUS.

CEMENTS, in chemistry, those powders and pastes with which any body is surrounded in pots or crucibles, and which are capable, by the help of fire, of producing changes upon that body. They are made of various materials; and are used for different purposes, as for parting gold from silver, converting iron into steel, copper into brass. By cementation more considerable changes can be effected upon bodies, than by applying to them liquids of any kind; because the active matters are then in a state of vapour, and assisted by a very considerable degree of heat. The earthen pots used in the cementation of metals, are called *Cement-pots*.

CE'NCHRIUS, (from κεγχρος *millet*), a species of *Herpes* that resembles *millet*.

CE'NCHRUS, a genus in Linnæus's botany, of which there are nine species.

CENEO'NES, (κενεωνες, from κενος, *empty*); the flanks.

CENTAU'REA, the GREATER CENTAURY; a genus of the polygamia frustanea order, belonging to the syngenesia class of plants; and in the natural method ranking under the 49th order, *Compositæ*. The receptacle is bristly, the pappus simple, the corollulæ of the radius funnel-shaped, longer than those of the disk, and irregular. There are sixty-one species. Some of these, and the root of one of them called *glastifolia*, are articles in the materia medica. It has a rough, somewhat acrid taste, and abounds with a red viscid juice. Its rough taste has gained it some esteem as an astringent, its acrimony as an aperient, and its glutinous quality as a balsamic: but the present practice takes very little notice of it in any intention. Another of the species is the *cyanus* or blue-bottle, which grows commonly among corn. See CYANUS.

CENTAU'REA BE'HEN; the systematic name of the officinal *behen album*. See BEHEN ALBUM.

CENTAU'REA BENEDI'CTA; the systematic name for the blessed thistle. See CARDUUS BENEDICTUS.

CENTAU'REA CALCITRA'PA; the systematic name for the calcitrapa. See CALCITRAPA.

CENTAU'REA CY'ANUS; the systematic name for the plant which affords the *flores cyani*, or common corn-flower. See CYANUS.

CENTAU'RIUM, (κενταυριον; from κενταυρος, *a centaur*): so called because it was feigned that, with it, Chiron cured Hercules's foot, which had been wounded with a poisoned arrow. It is the herb centaury. See CENTAUREA.

CENTAU'RIUM MINUS, (from κενταυρος, *a centaur*); the LESSER CENTAURY. It is the *Gentiana centaurium* of Linnæus and Hudson. *Gentiana corollis quinquifidis infundibuliformibus*, *caule dichotomo*, *pistilli simplici*. Class, *Pentandria*. Order, *Monogynia*: and *Chironia centaurium* of Withering and Curtis. This plant is esteemed by some as the most efficacious bitter of all the medicinal plants indigenous to this country. It has been thus spoken of by Cullen. "As this," says he, "is a species of gentian, it has the virtues of the genus, and has been commended for all the same qualities as gentian or other bitters. The centaury, therefore, is not very scientifically introduced, as commonly done, into the same compositions with the gentians. Professor Murray properly observes, that as an indigenous plant it may be properly preferred to a foreign drug; but I find it inconvenient to employ the centaury, as in an equal weight it takes up more of the menstruum than the root of the gentian: and if it is to be taken out by expression, it spoils the elegance of the infusion or tincture. Dr. Lewis has justly observed that the petals are insipid, or at least have very little bitterness; and it is therefore improperly that the *summitates* are commonly prescribed. It is said that the extract of this plant is less agreeable than that of gentian; but I find no difference between them, and think it should be constantly

substituted for that of gentian, as it may be more cheaply prepared."

The tops of centaury are directed for use by the colleges of London and Edinburgh, and are most commonly given in infusion; but they may also be taken in powder, or prepared into an extract in the common way.

CENTAURY. See Centaurium minus.

CENTENA'RIUS, the centenary; a Swedish weight, equal to sixty Swedish grains, or nearly sixty-three English grains.

CENTENI'NUM OVUM, a sort of hen's egg much smaller than ordinary, vulgarly called a cock's egg: from which it has been fabulously held that the cockatrice or basilisk is produced. The name is taken from an opinion, that these are the last eggs which hens lay, having laid a hundred before; whence *centenium*, q. d. the *hundredth* egg. These eggs have no yolks, but in other respects differ not from common ones, having the albumen, chalazes, membranes, &c. in common with others. In the place of the yolk is found a little body like a serpent coiled up, which doubtless gave rise to the fable of the basilisk's origin from thence. The cause is, with probability, ascribed by Hervey to this; that the yolks in the vitellary of the hen are exhausted before the albumina.

CENTRAL FORCES, the powers which cause a moving body to tend towards, or recede from, the centre of motion. See Centre.

CENTRE; the middle of any body, or, that point which is every way, or, as nearly as possible, equidistant, from its surface.

CENTRE, COMMON. In speaking *of the gravity of two bodies*, this is a point in a right line connecting their *centres;* and so placed in that line that their distances from it shall be reciprocally as the weight of those bodies; and, if another body is placed in the same right line, so that its distance from any point in it be reciprocally as the weight of both the former bodies taken together, that point shall be the common centre of gravity of all three.

CENTRE OF GRAVITY of any body, is a point on which that body being supported, or, from it suspended, all its parts will be in an equilibrium to one another. Thus the *centre* of gravity of the human body extended at length, is by Borelli, *De Motu Animalium*, placed between the *nates* and *pubes*, which is supposed very convenient for the act of generation.

CENTRE OF MOTION, that point about which a body moves when fastened any way to it, or, made to revolve round it.

CENTRE OF OSCILLATION, that point in a compound pendulum, where, if its whole weight were fastened, it would still oscillate or perform its swings in the same time as before; and consequently, it must be distant from the point of suspension by the length of a simple pendulum, whose oscillations are synchronal with those of the compound.

CENTRE OF PERCUSSION, that point in any body wherein the force of a stroke made with it is the greatest.

CENTRIFUGAL FORCE, (from *centrum*, a centre, and *fugo*, to fly); that force by which all bodies moving round any other body in a circle, or an ellipsis, do endeavour to fly off from the axis of their motion in a tangent to the periphery of it. And this force is always proportional to the circumference of the curve, in which the revolving body is carried round. The centrifugal force to the centripetal, is, as the square of the arch which the body describes in a given time, divided by the diameter, to the space through which any heavy body moves in falling from a place where it was at rest in the same time. If any body be put to swim in a medium heavier than itself, the centrifugal force is then the difference between the specific weight of the medium and the floating body.

CENTRIPETAL FORCE, (from *centrum*, a centre, and *peto*, to seek); that force by which any body moving round another is drawn or tends towards the centre of its orbit. If a body being specifically heavier than any medium, sinks in it, the excess of that body's gravity above the gravity of the medium, is the centripetal force of the body downwards.

CE'NTRUM OVA'LE. Vieuessens first called a part of the corpus callosum thus. It is convex, and of the form of the cerebrum. When the two hemispheres are removed on a line with the level of the *corpus callosum*, the internal medullary part presents a somewhat oval centre, which is thus called. Vieussenius supposed all the medullary fibres met at this place in the brain.

CE'NTRUM TENDINO'SUM; the tendinous part of the diaphragm, which has a triangular appearance. See Diaphragm.

CE'NTRUM NE'RVEUM; the same as Centrum tendinosum.

CENTUMNO'DIA, (from *centum*, a hundred, and *nodus*, a knot; so called from its numerous knots or joints); the common knot-grass: *Polygonum aviculare; floribus octandris trigynis axillaribus, foliis lanceolatis, caule procumbente herbaceo*, Linn. It is never used in this country, though still recognised in the foreign Pharmacopœias. It is said to be useful in stopping hœmorrhages, diarrhœas, &c. but little credit is to be given to this account.

CENTU'NCULUS, bastard pimpernel; a genus in Linnæus's botany. There is but one species.

CE'PA, (from κηπος, *a wool-card;* from the likeness of its roots), the common onion; *Allium cepa; scapo nudo inferne ventricoso longiore, foliis teretibus*, Linn. Dr. Cullen says, onions are

acrid and stimulating, and possess very little nutriment. With bilious constitutions they are apt to produce flatulency, thirst, head-ach, and febrile symptoms; but where the temperament is phlegmatic they are of infinite service, by stimulating the habit and promoting the natural secretions, particularly expectoration and urine. Hence they become useful to the lowest classes of society, too frequently debilitated by poor living and spirituous liquors. They are recommended in scorbutic cases, as possessing antiscorbutic properties. Externally, onions are employed in suppurating poultices, and suppression of urine in children is said to be relieved by applying them roasted, to the navel.

CE'PALA, a species of SEDUM.

CEPHALA'LGIA, (κεφαλαλγια, from κεφαλη, *the head*, and αλγος, *pain);* the HEAD-ACH. By some writers this term is used to signify a dull pain in the head, which is only of short duration; but most frequently, it is used as expressive of pain in the head in general, without regard to circumstances.

The head-ach is symptomatic of very many diseases, but is rarely an original disease itself. Dr. Home acquaints us that his report-books only furnish four instances of the latter, and, of these four, three were women. The disease proved fatal to the man; and, after death, a considerable effusion of blood was found on the brain, together with some hydatids, and water in the ventricles.

Head-achs appear frequently to be occasioned by effusions of blood or serum; as well as by ulcers, and abscesses of the brain, dura and pia mater. Accretions and ossifications of different parts of the dura mater, falx, and brain, are also frequently discovered. An ossification of the falx, however, does not always produce head-ach: for Dr. Home mentions a patient who had the falx ossified without head-ach; but he had been observed to be very furious when drunk. Congestions of blood in the vessels of the brain are also discovered, from dissections, to be a frequent cause of the head-ach; and nervous irritation alone will frequently produce it, as we see in the *clavus hystericus.*

In the Transactions of the London Society for medical and chirurgical improvement, Dr. Blane has given the history of some cases of head-ach arising from disease in the brain, with an account of the appearances after death, and some general observations on complaints of that nature. The first related is a case of head-ach arising from *aneurisms of the carotid arteries.* The subject of it was a lady, sixty-four years of age. Several of her family had been affected with complaints of the head, particularly apoplexy.

Upon examination after her death, there was no appearance in the brain itself that could in any way account for the symptoms. But there were found spiculæ of bone in the membrane forming the falx. The inner substance of the crura cerebri was of a brown colour, and more tender than natural; the optic nerves were smaller than natural, as if they had been wasted; and the septum lucidum was more than usually dense. But the morbid appearance, in this case, which was so singular, and to which the symptoms of complaint seem chiefly referable, was two bulbs about five-eighths of an inch in diameter, filling up the hollow on each side of the sella turcica, which were evidently dilatations of the carotid arteries, and, from their being filled with laminæ of coagulated blood, there could be no doubt of their being aneurisms of these arteries. The one on the left side was the largest. That on the right side communicated with the cavity of the artery, which was not the case with the other.

Dr. Blane's next case of cephalalgia is described to have arisen from a *tumor in the situation of the pineal gland.* The patient was an officer of the navy, who had been greatly harassed by professional service, though he enjoyed a good state of health through life, and was of temperate habits.

On opening his body after death, the appearances that presented were the following: the cranium was more vascular than natural, and also thicker, but irregularly so, being much thicker in some parts than others. The *diploe* appeared obliterated. The *dura mater* separated very easily from the cranium, and the surface of the bone was somewhat rough, as if from numerous blood-vessels entering it. In the lateral ventricle of the brain, there were about three ounces of fluid. The *fornix* and *septum lucidum* were softer in texture than usual. There was a little water in the third ventricle. The *nates and testes* did not appear distinct, and in the situation of the pineal gland was a hard firm tumor, of the size and shape of a nutmeg, about half an inch in diameter. Though in consistence it was like soft cheese, and cut smooth; yet it was not inorganic, for it had blood-vessels in its substance. It lay in the angle, as it were, formed by the two lobes of the *cerebellum* and the protuberances called *nates* and *testes*, a little on one side, that is, towards the right. The substance of the cerebellum appeared as if bruised or mashed by it, and the pulpy matter adhered to the tumor; but whether this was merely from proximity, or that they were united in substance, could not, from the softness of the cerebellum, be clearly ascertained. There was no pineal gland to be found, but whether this tumor itself was the pineal gland in a diseased state, or that by the size and pressure of the tumor, that small organ was destroyed and obliterated, must be matter of conjecture. As the tumor did not adhere to that part to which the pineal gland is attached, Dr. B. inclines to the latter opinion. The substance of the brain in general

was rather of a firmer consistence than is usually found. In other respects the brain and cerebellum appeared natural and sound.

The thorax being examined, there were numerous tubercles on both sides, such as are found in the beginning of phthisis pulmonalis. There was rather more water than natural in the pericardium, and there was much fat on the heart. Under the skin, near the right mamma, was a small tumor, in size and consistence not unlike that which was found in the brain, but it was of a flat shape, and had a sac.

Dr. Blane supposes it will hardly be doubted, that the tumor in the brain was the principal and perhaps primary cause of the patient's symptoms, as well as of all the morbid appearances in the head. "It was," says he, "a disease, most probably, out of the reach of art, but the only means that occur to me, either from experience or analogy, as advisable, would have been a course of mercury at an early period of the complaint. We know that this can, in other cases, excite an absorption of solid matter deposited in disease, and I have known cases of chronic head-ach, though not of a venereal nature, cured by courses of mercury."

Of this kind there are several specimens among the morbid preparations, in the collection of Dr. Hunter. These unnatural productions were in the substance of the *cerebrum.* One occurred to Dr. Blanc, of which the following were the most remarkable symptoms and appearances. "The patient complained for six months before his death. During the first four months of this time, the symptoms consisted chiefly in long, frequent, and painful spasms of the muscles of the extremities of the left side. He was attacked with a *hemiplegia* of that side two months before his death, and had the usual symptoms of that complaint while he lived. The spasms from that time ceased. Upon inspection of the brain, there was found between the lateral ventricle and the parietal bone, an extensive *sinus*, and a round tumor, like what has been described at that extremity of it which was contiguous to the bone. The subject was a middle-aged man, much addicted to venery."

In reviewing his notes on the subject of morbid appearances of the brain, the most interesting case which he thinks material to add, is that of a great *thickening and hardness of the skull, with bony protuberances*, some of which were blunt and others sharp, proceeding chiefly from the basis of it. The most remarkable symptoms had been temporary failures of memory for some months before death, sudden fits of insensibility, like apoplexy, from time to time, for some weeks before death; and violent convulsions, attended with severe sufferings for some days before that event.—During the existence of this disease, there was at intervals an entire freedom from complaint; and it is remarkable, that in various other diseases affecting the structure of vital parts, the functions are at intervals perfect and unimpeded, and symptoms of disorder arise only when the parts are too much excited or disturbed, or when the cause of the disease arises to a great height.

It sometimes happens, that the brain is in a diseased state, even that of suppuration, abscess, bloody or serous effusion, without any head-ach.

On the other hand, the ordinary head-achs with which people are affected, seem to be seated in the integuments of the head.—The seat of that kind called hemicrania is certainly in these parts; for there is a great tenderness on external pressure; and as there is sometimes an obscure redness of the skin, and a suffusion of the eye, it would appear that the proximate cause is too great fulness, or *error loci*, in the circulating vessels. This state of the vessels seems to be induced rather by a weakness of the vessels than too great action, for evacuations are in general of more hurt than benefit, and if it is relieved, or cured, it is by remedies of an opposite nature. This complaint, particularly when periodical, Dr. Blane says, is often successfully treated by administering valerian freely, conjoining with it, occasionally, cinchona and the preparations of iron.

One of the most common morbid appearances, upon inspecting cases of *chronic head-ach*, is a thickening of the membranes of the brain, owing probably to a slow inflammation. The cases in which mercury has been found successful, have most probably been of this kind. It seems to act here, as it perhaps does in the venereal disease, by exciting absorption, and in both the most successful method of introducing it is by friction.

A case of cephalalgia, attended with uncommon symptoms, is related by Mr. Henry, of Manchester, in the Memoirs of the Medical Society of London. The patient was of a consumptive habit, subject to a cough from his infancy, and had had glandular tumors of the neck. After many vicissitudes with regard to his consumptive complaints, he recovered a better state of health than could have been expected; but he was at length affected with an uncommon pain in his head, which attacked him every night as he lay down in bed, and sometimes also in the day time, at irregular hours. The description he gave of it was as follows:

"At its first coming on, it fixed in so small a space that he could cover it with the end of his finger. The seat of it was in the lower part of the *coronal suture*, about an inch above the *os sphenoides;* and he shewed me," says Mr. Henry, "a vacuity or chasm, about an inch long and one-sixth of an inch broad, in the course of the *suture*, which he seemed certain was not pre-existent to his head-

ach; as he judged it impossible it could have escaped his notice, having always shaved himself. While the pain, which was excessively acute and lancinating, remained here, the part was puffed up like an inflated bladder, for about the size of a half-crown piece, and the temporal artery appeared tense, like a distended cord. From hence it removed to the *processus condyloides*, and, while it remained there, occasioned a convulsive motion of the lower jaw; it then changed its situation to an inch and half below the angle of that bone, and after some duration in that point he became suddenly and totally easy. He had laboured under these complaints during three weeks."

About ten days afterwards, he gave Mr. Henry the following account: "That his breath had had an unusually disagreeable and earthy smell, which commenced some days after the pain in his head first begun; and that, as he was sitting in his own house, the day after his former application, without any previous fit of coughing or retching, he was suddenly in danger of suffocation by something falling into the œsophagus, where it stuck. With considerable efforts, he spat up an angular solid substance, above the size of the end of his thumb, consisting of a hard brown and white matter, the latter of which, on being pressed, fell into a dry powder. The whole was covered with a greenish mucus, and resembled exactly in smell the fetor which had affected his breath for several preceding days, and which now immediately ceased. He had felt no pain the day before this happened, nor had it returned since that time." On examining the seeming deficiency in the suture, he complained of intolerable uneasiness from the pressure, which he said seemed to affect the internal part of his head.

About a week after this, he had a slight return of the pain in his head, which lasted about two minutes; he then perceived something to fall into his throat, which he soon discharged, and proved to be similar to what he had before parted with, but in smaller quantity, and broken into several fragments. His pain instantly ceased, but a numbness continued in the side of his head and face, for several hours, both after this and the preceding evacuation. Having examined this matter with a miscroscope; the white part appeared to be *calcareous*, the brown to be *mucus*, hardened and adhering to the other. The smell was like that of bones, which have been long buried in the earth, on their being exposed to the air. The white matter strongly fermented with vitriolic acid, but the brown occasioned no effervescence with it. The vacuity in the cranium was much diminished, when Mr. Henry saw him, two days after this event; and he could then bear pressure upon the integuments without suffering any pain.

"From this time," says Mr. Henry, "he had no further return of his pain during many months; and he acquired such a degree of strength as to be able to attend to the business of his farm, and even to ride thirty miles a-day on horseback: and, had I not been witness to the many vicissitudes of his constitution, I should have entertained hopes of the re-establishment of his health. But in January 1772, his cough again became worse; convulsive spasms sometimes attacked his head and neck; his stomach rejected almost every kind of food; and, often, the only liquor which it would retain was rum, unmixed with water: he also complained of a sense of contraction in that organ. After having lingered in this miserable situation till the beginning of April, 1773, death put a period to his sufferings."

Unfortunately, no light was thrown on this case by an examination of the body, though the patient in his life-time had desired it. The author of this case is therefore much at a loss to account for the above singular appearances. "In the first place," says he, "it may be asked, was there a translation of matter from the lungs to the brain, or its meninges; and, supposing that to be the case, would it not have produced more alarming symptoms? Of what nature was the substance he evacuated, and where could it have lodged, previous to its discharge? He had no sense of uneasiness, or obstruction in the frontal sinuses; nor about the nose nor fauces. Whence arose the vacuity in the sutura coronalis? Is it probable, that there had been a solution of the bone, from some acrimonious matter, which had been gradually absorbed, or immediately carried through the sphenoidal sinus to the nasal, and so deposited in the cellular membrane behind the velum palati? Or was it formed without any disease in the cranium or its contents; and did the head-ach arise from the irritation of this extraneous body wherever situated, antecedent to its falling into the œsophagus? And in this case might not the violence of the pain occasion a separation of the suture, so as to produce the chasm I have mentioned, without any loss of substance?"

The means by which nature sometimes relieves herself from any noxious matter, and places it out of the course of the circulation, are often altogether inexplicable. It is, however, curious to trace her steps, as far as our limited faculties permit, and to mark the efforts she makes; as such observations may at least teach us, that she may successfully exert herself, where art proves vain.

There are many cases of head-ach depending on indigestion, and the seat of some seems to be the integuments, as there is generally, as we have said, tenderness to the external touch. We have treated fully of the *symptomatic cephalalgia* under the article Head-ach.

One of the principal difficulties in practice, Dr. Blane observes, is to discriminate those cases of head-ach which depend on the stomach, from those depending on some affection of the part itself; and

it may be affirmed in general, that one of the chief causes of ambiguity, in ascertaining the seat and causes of diseases, arises from the mutual consent resulting from the nice dependence of every part and function upon every other part and function; a dependence which in health is essential to the existence and welfare of the whole system. In consequence of this connection, one organ draws another into sufferance, and renders it difficult to ascertain which of them is primarily affected.

For distinguishing the *rheumatic head-ach* from that which arises from crudities in the stomach, Dr. Dürr points out the following diagnostics: 1. The first remits sometimes so much of its vehemence, that the patient remains free from it for several hours, whereas the other kind of head-ach continues with equal violence. 2. On moving the head, the patient feels greater pains in the rheumatic head-ach. 3. This kind of head-ach is increased by cold, and the patients are therefore obliged to cover the head. 4. As soon as pains come on in other parts of the body, it begins to abate, and increases again when those go off. 5. The least motion of the head excites that head-ach again, after its having previously abated. 6. The rheumatic head-ach is limited to one part of the head; whereas, that arising immediately from the stomach affects the whole head, or, at least, the fore and back part of it.

There is, he says, no part of morbid anatomy better understood than the connection of the common hemiplegia with a certain diseased state of the brain; but there are many other affections of this organ, of which the history is very defective.

The symptoms attending diseases of the brain are head-ach, vertigo, delirium, spasms, convulsions, palsy, mental derangement, and imbecility. If the morbid history of the brain were perfect, Dr. Blane thinks, we should be able, from the history of the various combinations, the duration, and successions of these, to infer the internal change which produces them. The actual state of our knowledge however is such, as to leave us in great doubt and uncertainty on this subject.

The foregoing histories show how little can be done by art, in chronic head-achs, arising from causes so irremediable, even if previously known; but much greater is the difficulty to which the physician is exposed, when the disease is so truly anomalous as has been represented. Hence the head-ach is frequently incurable. In congestions, and nervous affections, medicines may indeed be of some service. Congestion may be relieved by an evacuation of blood, either general or topical; as venesection, cupping, or leeches: by errhines; which, however, Dr. Home thinks are little to be depended upon: by topical evacuations near the head, by blisters, issues, or setons; by purgatives; or by determining the fluids to other parts, by rubefacients applied to the temples, pediluvia, &c.

Nervous irritations may be diminished—1. By a great quantity of cold water drank every morning. This is recommended by Hoffmann, with a view to wash off all acrid principles from the stomach, while the cold strengthens and diminishes its sensibility. This remedy was tried for a considerable time in one of Dr. Home's patients, without any effect. 2. Nervous and tonic medicines; as the bark, valerian, iron, &c. These were tried in two of Dr. Home's patients, but also without success. In a third, however, the valerian succeeded. 3. By cold water applied to the head, immersion, or the shower-bath. 4. Cephalics; as lavender, rosemary, &c. In slight cases, the smell of eau de luce, or any strong volatile alkali, will generally prove a cure. Other palliatives are mentioned under HEAD-ACH.

CEPHALA'LGIA CATARRHA'LIS, head-ach with catarrh, from cold. See CATARRH.

CEPHALA'LGIA INFLAMMATO'RIA, i. e. phrenitis. See PHRENITIS.

CEPHALA'LGIA SPASMO'DICA; the sick head-ach. See HEAD-ACH.

CEPHALA'NTHUS, BUTTON-TREE; a genus in Linnæus's botany. There is one species.

CEPHALI'TIS; inflammation of the brain. See PHRENITIS.

CEPHALE'A JU'VENUM; the head-ach that often attends youth at the approach of puberty.

CEPHA'LICA VENA, (so called, because the head was supposed to be relieved by bleeding from it); the cephalic vein. It is the anterior vein of the arm, that receives the cephalic of the thumb. This vein receives, at the extremity of the radius, branches which correspond with those of the radial artery; and these form numerous areolæ, which communicate freely with each other.

From the under-part of the fore-arm the trunk of the vein runs along the radius between the muscles and integuments, receiving branches from both sides, which communicate with other branches of the same vein, and with some of the basilica, forming areolæ much in the same manner as the saphena does in the lower extremity. That part of the vein which lies on the fore-arm, Mr. Fyffe speaks of as a *radialis externa*. Having reached a little below the fold of the arm, it receives a large branch, which may be called *mediana cephalica*. This comes up obliquely from the middle of the fold of the arm, under the integuments, and over the tendon of the biceps. These two medianæ are sent off in an angle, the apex of which is turned downward. The mediana cephalica sometimes receives a long branch called *radialis interna*, which lies almost parallel to the radialis externa.

The two median veins are sent off from a trunk which may be called *mediana major*, or *longa*, to distinguish it from the other two. This trunk runs up from the fore-arm between the cephalic and ba-

silic veins, communicating with both in its passage by various branches. At the part where it divides into the two branches already named, a branch opens into it called *vena cubiti profunda*. This comes from the neighbouring muscles, after having communicated with the other veins of the fore-arm.

A little below the external condyle of the os humeri, it receives a branch posteriorly, which passes down between the brachialis muscle and the upper portion of the supinator longus, after bending between the os humeri and anconæus externus, and communicating with some branches of the basilic vein.

The cephalica runs next up along the outer edge of the external portion of the biceps; communicating several times with the vena basilica, and receiving small rami on each side, from the neighbouring muscles, fat, and skin. Some branches go into its upper part, which lower down were sent off from its trunk.

It runs afterwards between the deltoid and large pectoral muscles, communicating in its passage with a branch called the *small cephalic*, and terminates in the axillaris.

CEPHALICS, (κεφαλικα; from κεφαλη, *the head);* such remedies as are adapted for the cure of disorders of the head. Of this class are the snuffs which produce a discharge from the mucous membrane of the nose, &c.

CEPHA'LICUS, (κεφαλικος, *cephalic*, from κεφαλη, *the head).* The remedies against disorders of the head are called cephalics.

CEPHALOI'DES, (κεφαλοειδης, *shaped like a head*, or *having a head)* ; a term applied to those plants which are called *capitated.*

CE'PHALO-PHARYNGÆUS, (from κεφαλη, *the head*, and φαρυγξ, *the throat)* ; a muscle of the pharynx, otherwise named *constrictor pharyngis superior.* It arises above from the cuneiform process of the os occipitis, before the foramen magnum, from the pterygoid process of the sphenoid bone, from the upper and under jaw, near the roots of the last dentes molares, and between the jaws. It is inserted in the middle of the pharynx. Its use is to compress the upper part of the pharynx, and to draw it forwards and upwards.

CE'RA, WAX, a substance collected by the *apis mellifica*, or common honey-bee, from flowers and vegetables, for the purpose of constructing the cells destined to contain its honey. See WAX.

CE'RA FLAVA; yellow wax. This is obtained from the honeycombs, after the honey is taken, by heating and pressing them betwixt iron plates. In fact, it is the matter of which the honeycomb consists. The best sort of it is of a lively yellow colour, and an agreeable smell, somewhat like that of honey: when new, it is rather tough, yet easy to break; by age it becomes harder and more brittle, loses its fine colour, and in great measure its smell.

CE'RA ALBA; white wax. This is prepared from the yellow (see CERA FLAVA), by reducing it into thin flakes, and exposing it for a length of time to the air: when sufficiently bleached, it is melted, and cast into cakes. Some have attempted to effect this with the oxygenated muriatic acid; but the method is difficult. The best white wax is clear and almost transparent, and of a light agreeable smell like that of the yellow wax, but much weaker. The chief medicinal use of wax is in cerates, plasters, unguents, &c. and as an emollient for irritable sores. It readily unites with oils and animal fats, but not with watery or spirituous liquors. It is given also internally in diarrhœas, dysenteries, &c. either mixed with oily substances, or divided by earthy powders. Dr. A. Duncan says, when taken internally, wax agrees in its effects with the fat oils; and, though less frequently prescribed in this way, it is preferable, it being less apt to become rancid. Poerner recommends it as an excellent remedy in diseases of the intestines, attended with pain, excoriation, and obstinate diarrhœa. He gave a scruple, or half a drachm of wax, three or four times a-day, in the form of an emulsion, by melting it first with some fixed oil, and then mixing it with a decoction of groats, by trituration with the yolk of an egg.

The uses to which wax, both white and yellow, is applied in pharmacy, are many. The following are the topical remedies prepared with the former:

Unguentum Ceræ. Lond. Dubl.

℞ Ceræ albæ unc. iv
Spermatis ceti unc. iv
Olei olivæ lib. j.

These, after being melted together, are to be briskly stirred till quite cold.

This ointment is nearly the same with the *Ung. simp.* of the Edinburgh Pharmacopœia, and forms a convenient mild dressing for superficial wounds.

Unguentum Ceræ compositum. Pharm. Chir.

℞ Unguenti ceræ unc. j
Styracis colati drach. j.

The wax ointment being first melted, the storax is then to be added, after which it is to be kept for two hours by the fire in a fluid state, and occasionally stirred. During the process, it may be coloured by the addition of a little alkanet root.

This is said to be a very excellent application to the lips when chapped or excoriated.

Unguentum Ceræ cum Aceto. Pharm. Chir.

℞ Ceræ albæ unc. iv

Olei olivæ lib. j
Aceti distillati unc. ij.

The two former ingredients being first melted together, the distilled vinegar is to be gradually stirred in.

This makes an elegant *nutritum* for superficial excoriations, cutaneous eruptions, &c.

Unguentum Ceræ cum Hydrargyro. Pharm. Chir.

℞ Ceræ flavæ unc. viij
Adipis suillæ præparatæ unc. iv
Olei olivæ unc. ij
Unguenti hydrargyri unc. j.

The three first are to be melted together, and stirred till they are a good deal cooled, when the quicksilver ointment is to be incorporated thoroughly with them.

This nearly resembles the former *ceratum merculiale*, which the London college has expunged. It is said to be a useful application to languid ulcers, acting favourably on their callous edges.

CE'RA DI CA'RDO; the Italian name for the gum of the *carduus pinea*.

CERÆ'Æ, (κεραιαι, from κερας, *a horn*). So Rufus Ephesius calls the cornua of the uterus.

CERA'MIUM; a Greek measure of nine gallons.

CERANI'TES, (κερανιτης). A pastil or troch is thus named by Galen.

CE'RASA NIGRA, (κερασος, from κερασουλη, a town in Pontus, whence Lucullus first brought them to Rome; or from κηρ, *the heart*, from its resemblance to it in shape); the BLACK CHERRY. It is the fruit of the *prunus avium; umbellis sessilibus, foliis ovato-lanceolatis, subtus pubescentibus, conduplicatis*, Linn. The flavour of black cherries is sweet, and, if they are not taken in too large quantities, they are extremely salutary. See FRUITS. A gum exudes from the different species of cherry-tree, whose properties are similar to those of gum arabic.

Dr. Cullen, whilst he admits, that the kernels in the stones of the *cerasa nigra* do contain a like matter with the lauro-cerasus; and that, by a certain management, a very powerful poison can be obtained from them, still contends, that they do not contain it in the same proportion: "and," says he, "it is a question with me, if the distilled water, as formerly extracted from black cherries and their bruised kernels, contains it so largely as should engage the colleges both of London and Edinburgh to reject an agreeable water from their dispensatories. If the kernels are bruised only so far as is necessary to the breaking of the stones, and at the same time a good deal more water is added than the weight of the cherries, and that less than the whole of this is drawn off, I am persuaded that such a water will be very safe, and particularly in the quantities employed in our juleps. I shall not indeed advise the tampering with such a thing in the case of infants; but surely an article under a certain preparation, and in a certain dose, being a poison, will not, in the present age, be an objection to its being employed in other circumstances as a medicine."

CE'RASA RUBRA, the RED-CHERRY; the ripe fruit of the *prunus cerasus*; *umbellis subpedunculatis, foliis ovato-lanceolatis glabris conduplicatis*, Linn. These have a pleasant, acidulous, sweet flavour, and are supposed by some to be proper in fevers, scurvy, and bilious obstructions; though we have many more wholesome fruits for such purposes. Red cherries are mostly eaten as a luxury, and agree very well, except with those whose bowels are remarkably irritable.

CERA'STIUM, mouse-ear chickweed; a genus in Linnæus's botany. He enumerates sixteen or seventeen species.

CERATI'TIS, the yellow horned poppy. It is also a name for the unicorn-stone.

CERA'TIUM, the fruit of the carob tree.

CERATO-CA'RPUS, a genus in Linnæus's botany. There is but one species.

CERATO-GLO'SSUS, (from κερας, *a horn*, and γλωσσα, *a tongue*). See HYO-GLOSSUS.

CERATOI'DES, (from κερατος, the genitive case of κερως, *horn*); a name for the *cornea* of the eye. Also a species of *axyris* has this name.

CERATO'NIA, the CAROB-TREE, or St. John's bread; a genus in Linnæus's botany. There is but one species. See SILIQUA DULCIS.

CERATOPHY'LLUM, pond-weed; a genus in Linnæus's botany. He enumerates two species.

CERA'TUM ALBUM. See CERATUM SPERMATIS CETI.

CERA'TUM CANTHA'RIDIS. See CANTHARIDES. This is a much milder preparation than the unguentum cantharidis, and is applied to keep up a discharge from blisters, where the skin is very irritable, and a milder stimulus is intended.

CERA'TUM CI'TRINUM. See CERATUM RESINÆ FLAVÆ.

CERA'TUM EPULO'TICUM. See CERATUM LAPIDIS CALAMINARIS.

CERA'TUM LAPIDIS CALAMINA'RIS, cerate of calamine. See CALAMINE. The old name for this was *Turner's cerate*, and *ceratum epuloticum*. It is calculated to promote the cicatrisation of ulcers.

CERA'TUM LITHA'RGYRI ACETA'TI. See LITHARGYRUM. This is a proper application to superficial ulcers which are inflamed.

CERA'TUM RESI'NÆ FLAVÆ; also called *ceratum citrinum*. This is merely a milder application than the *unguentum resinæ flavæ*. See RESINA.

CERATUM SAPO'NIS, soap cerate. This is often applied round a fractured bone, as it possesses a convenient degree of adhesiveness, and at the same time the usual properties of a saturnine remedy. See SAPO.

CERA'TUM SPERMATIS CETI, formerly called *ceratum album*. It is a mild unctuous compound, and may be applied with advantage to all ulcers, where no stimulating substance can be allowed. See SPERMACETI.

CERAU'NIA, CERAUNIAS, or CERAUNIUS LAPIS, (from the Greek κεραυνος, *thunderbolt)*: a sort of flinty stone, of no certain colour, but of a pyramidal or wedge-like figure; supposed to have fallen from the clouds in the time of thunder-storms, and to be possessed of many notable virtues, as promoting sleep, preserving from lightning, &c. The ceraunia is the same with what is otherwise called the thunder-stone, or thunder-bolt; and also sometimes *sagitta*, or arrow's head, on account of its shape. The ceraunice are frequently confounded with the *ombriæ* and *brontiæ*, as being all supposed to have the same origin. The generality of naturalists take the ceraunia for a native stone, formed among the pyrites, of a saline, concrete, mineral juice. Mercatus and Dr. Woodward assert it to be artificial, and to have been fashioned thus by tools. The ceraunia, according to these authors, are the heads of the ancient weapons of war, in use before the invention of iron; which, upon the introduction of that metal, growing into disuse, were dispersed in the fields through this and that neighbouring country. Some of them had possibly served in the early ages for axes, others for wedges, others for chissels; but the greater part for arrow-heads, darts, and lances. The ceraunia is also held by Pliny for a white or crystal-coloured gem, that attracted lightning to itself. What this was, is hard to say. Prudentius also speaks of a yellow ceraunia; by which he is supposed to mean the carbuncle or pyropus. The attention of chemical philosophers has lately been drawn to the stones said to have fallen from the sky, and the fact is countenanced by their analysis; but the attributing peculiar medical virtues to them is an idle superstition.

CEREA'LIA, (from *Ceres*, the goddess of corn), in botany; Linnæus's name for the larger esculent seeds of the grasses: these are rice, wheat, rye, barley, oats, millet, panic-grass, Indian millet, holcus, zizania, and maize. To this head may be likewise referred darnel, *lolium;* which, by preparation, is rendered esculent.

CEREBE'LLUM (dim. of *Cerebrum*); the little brain. The cerebellum is contained under the transverse septum of the dura mater, in the under and back part of the cranium. It is broader laterally than on the fore or back sides, flatted on the upper side, and gently inclined both ways, answerable to the septum, which serves it as a kind of tent or ceiling. On the lower side it is rounder; and on the back side it is divided into two lobes, separated by the occipital septum of the dura mater.

It consists, like the cerebrum, of two substances, the cortical and the medullary. It has no circumvolutions on its surface; but, instead of them, numerous fulci, which are deep, and disposed in such a manner as to form thin flat strata, more or less horizontal, between which the internal lamina of the pia mater insinuates itself by a number of septa equal to that of the strata.

Under the transverse septum, it is covered by a vascular texture, which communicates with the plexus choroides. It has two middle eminences, called *appendices vermiformes*; one anterior and superior, which is turned forward; the other posterior and inferior, which goes backward. There are likewise two lateral appendices, both turned outward. They are termed *vermiformes*, from their resemblance to a large portion of an earthworm.

Besides the division of the cerebellum into lateral portions, or into two lobes, each of these lobes seems to be likewise subdivided into three protuberances; one anterior, one middle or lateral, and one posterior: they are not, in all subjects, equally distinguished either by their convexity or limits; but they may always be distinguished by the direction of their strata, those of the middle and anterior protuberance being less transverse than the posterior.

We here meet with the fourth ventricle of the brain. When we separate the two lateral portions or lobes by a deep incision, we discover, first of all, the posterior portion of the medulla oblongata. See MEDULLA OBLONGATA. And, in the posterior surface of this portion, from the tubercula quadrigemina, all the way to the posterior notch in the body of the cerebellum, and a little below that notch, we observe an oblong cavity, which is the *fourth ventricle*; terminating backward, like the point of a pen, and hence called *calamus scriptorius*.

At the beginning of this cavity we meet with a thin medullary lamina, which is supposed to act as a valve between that canal and the fourth ventricle. A little behind this lamina, the cavity grows wider towards both sides, and then contracts again to its first size. It is lined by a thin membrane, and seems often to be distinguished into two lateral parts, by a kind of small groove, from the valvular lamina to the point of the calamus scriptorius.

This membrane is a continuation of that part of the pia mater which lines the small canal, the third ventricle, infundibulum, and the two great ventricles. Mr. Fyffe says, if we would see the fourth ventricle in its natural state, in which it is narrowest, it must be laid open while the cerebellum remains in the cranium; and, in order

to that, the os occipitis must be sawn very low down.

On each side of the fourth ventricle, the medullary substance forms a trunk which expands itself in laminæ through the cortical strata. But here we find the medullary bearing a less proportion to the cortical than it does in the cerebrum. We discover these medullary laminæ according to their breadth, by cutting the cerebellum in slices almost parallel to the basis of the cerebrum; but, if we cut one lobe of the cerebellum vertically, the medullary substance will appear to be dispersed in ramifications through the cortical substance. These ramifications have been named *arbor vitæ;* and the two trunks, from whence these different lamiuæ arise, are called *pedunculi cerebelli.*

We are precluded from a farther description of the other middle parts of the basis of the cerebellum, because this and the middle parts of the basis of the cerebrum are united, and jointly form the medulla oblongata. See MEDULLA OBLONGATA. The strata of both substances of the cerebellum are not always of the same extent in the same portions or protuberances of each lobe, as appears merely by viewing the outer surface of the cerebellum; for there we see, at different distances, some cortical strata shorter than others, and likewise that the extremities of the short strata gradually diminish in thickness, till they are quite lost between two longer.

Mr. Fyffe directs us to make a small hole in the external lamina of the pia mater, over one of the lobes of the cerebellum, without touching the inner lamina. If we then blow into the cellular substance, connecting these two laminæ, through a small pipe, the air will gradually distend it, and separate the strata more or less equally from each other through their whole extent; and we shall see, at the same time, the disposition of all the membranous septa or duplicatures of the internal lamina of the pia mater, with the fine distribution of blood vessels which run upon it.

CEREBRUM, (quasi *Carabrum*, from καρα, *the head)*, the BRAIN. The cerebrum, properly so called, is a kind of medullary mass, of a moderate consistence, and of a greyish colour on the outer surface, filling all the superior portion of the cavity of the cranium, or that portion which lies above the transverse septum. The upper part is of an oval figure, like the upper half of an egg, divided horizontally, or rather like two quarters of an egg cut lengthwise, and parted a little from each other. Each lateral half of the brain is divided into three eminences, corresponding with the cavities at the basis of the skull.

The cerebrum is divided into two lateral portions, separated by the *falx*, or great longitudinal septum of the dura mater. These are generally termed *hemispheres*, but they resemble more the quarters of an oblong spheroid. Each of these portions is divided into two extremities, one anterior, and one posterior, which are termed the *lobes of the cerebrum*, between which there is a large inferior protuberance which goes by the same name; so that in each hemisphere there are three lobes, one anterior, one middle, and one posterior.

The anterior lobes are situated upon those parts of the os frontis which contribute to the formation of the orbits and of the frontal sinuses, commonly called the *anterior fossæ* of the basis of the skull. The middle lobes lie in the middle or *lateral fossæ;* and the posterior lobes on the transverse septum of the dura mater. The anterior and middle lobes of the cerebrum, on each side, are parted by a deep narrow sulcus, which ascends obliquely backward, from the temporal wing of the os sphenoides to near the middle of the os parietale; and the two sides of this division have each their particular ridges and convolutions, which gives a very great extent to the cortical substance. This sulcus is named, by some anatomists, *fissura magna Sylvii*, or simply *fissura cerebri.*

Each lateral portion of the cerebrum has three sides; one superior, which is convex; one inferior, which is uneven; and one lateral, which is flat, and turned to the falx. Through the whole surface of these three sides there appear inequalities or windings, formed by weaving streaks or furrows, very deep and narrow, into which the duplicatures of the pia mater insinuate themselves. Near the surface of the cerebrum, these circumvolutions are at some distance from each other, representing serpentine ridges; and, in the interstices between them, run the superficial veins of the cerebrum, between the two laminæ of the pia mater, from whence they pass into the duplicature of the dura mater, and afterwards discharge their blood into the sinuses. These circumvolutions are fixed through their whole depth to the septa or duplicatures of the pia mater, by an infinite number of very fine vascular filaments. On cutting the cerebrum transversely, we may observe, that the substantia alba lies not only in the inner part of the brain in general, but also within each circumvolution, so that there is the same number of internal medullary circumvolutions as of external cortical ones; the first representing white laminæ invested by others of an ash colour; but the cortical substance is in many places thicker than the medullary.

The substance of the cerebrum is of two kinds, one part of it being of a grey or ash colour; the other, which is somewhat firmer than the former, is remarkably white, but redder in the fœtus. The ash-coloured substance lies chiefly on the outer part of the cerebrum like the bark on a tree, from whence it has been named *cortical.* The white substance occupies the inner part, and is named *medullary.* This is in greater quantity than the

other, and in many places is perforated with arteries.

Upon cutting off the falx from the crista galli, and turning it backward, if we gently separate the two lateral parts or hemispheres of the brain, we see a longitudinal portion of a white convex body, which is named *corpus callosum*. See Corpus Callosum. This becomes afterwards continuous on each side with the medullary substance; which through all the remaining parts of its extent, is entirely united with the cortical substance, and, together with the corpus callosum, forms a *medullary arch* or vault of an oblong or oval figure. To view this, the whole cortical substance, together with the medullary laminæ mixed with it, must be carefully divided in direction of the convexity of the cerebrum, after which we observe a medullary convexity, much smaller than that which is common to the whole cerebrum, but of the same form; so that it appears like a medullary nucleus of the cerebrum, especially when we consider it together with the medullary substance of the inferior part or basis of the cerebrum; for the deeper we go, the medullary part becomes the broader. From thence it was that M. Vicussens named this nucleus the *centrum ovale*.

Under this arch there are two lateral cavities, much longer than broad, and very shallow, separated by the septum lucidum (see Septum lucidum). These cavities are generally named the *anterior superior ventricles*, to distinguish them from two smaller cavities which are situated more backward. The *lateral ventricles* are broad, and rounded at those extremities which lie next the septum lucidum. They go from before backward, contracting in breadth, and gradually separating from each other in their progress. Afterwards they bend down, and return obliquely from behind forward, in a turn like that of a ram's horn, and terminate almost under their superior extremities, only a little more backward and outward.

At the posterior part where they begin to bend downward, a particular elongation runs backward on each side, and terminates in a triangular pointed cavity, turned a little inward, the two points resembling horns. These ventricles are every where lined with the pia mater.

The *Septum lucidum* and *Fornix* are the parts next in order to be described; but for these we refer to their particular heads. Under the latter, and immediately behind its anterior crura, there is a hole of a considerable size, by which the two lateral ventricles communicate, and another passage leads down from this, called by different anatomists, *foramen commune anterius*, *vulva*, *iter ad infundibulum;* but Mr. Fyffe thinks more properly *iter ad tertium ventriculum.*

We are next to describe the *eminences* which are observable on the cerebrum. The fornix being divided and inverted, or quite removed, we see first of all a vascular web, called *plexus choroides*, and several eminences more or less covered by the expansion of that plexus. There are four pairs of eminences which follow each other very regularly, two large and two small. The first two great eminences are named *corpora striata;* and the second, *thalami nervorum opticorum.* The four small eminences are closely united together, the anterior being called *nates*, and the posterior *testes.* Immediately before these tubercles there is a single eminence, called *glandula pinealis.* See Pineal Gland.

The eminences distinguished by the names *Corpora striata* and *Thalami nervorum opticorum*, are described under their several heads. See also the articles Infundibulum, Plexus Choroides, Glandula Pituitaria, &c.

The *third ventricle* next lays claim to our attention. Immediately under the beginning of the thalami nervorum opticorum, lies a particular cavity called the *third ventricle of the cerebrum.* This cavity communicates at its upper and fore part with the passage between the two lateral ventricles, and sends down, from its under and fore part, a passage through the infundibulum. It opens backwards into the passage called *iter ad quartum ventriculum.*

The *tubercles* of the cerebrum are four in number, two anterior and two posterior, adhering together as if they made but one body situated behind the union of the thalami nervorum opticorum. They are transversely oblong, the anterior being a little more rounded, and broader or larger from before backward, than the posterior. Their surface is white, and their inner substance greyish. The names of *nates* and *testes*, given by the ancients to these parts, Mr. Fyffe thinks are not very proper, they having little or no resemblance to the parts from which the names are taken. Some of the moderns with still less propriety, have called them *tubercula quadrigemina.* However, to avoid confusion, we shall use the names most generally preferred.

Directly under the place where the tubercles of one side are united to those of the other side, we find the *iter ad quartum ventriculum*, which communicates, by its anterior opening, with the third ventricle, under the thalami nervorum opticorum, and, by its posterior opening, with the fourth vencle, which appertains to the cerebellum.

Where the convex parts of the two anterior tubercles join these posterior convex parts of the thalami nervorum opticorum, an interstice or opening, the *foramen commune posterius*, is left between these four convexities; but it does not communicate with the third ventricle, for the bottom of it is shut up by the pia mater. By some anatomists the name of *anus* is applied to this part.

In plate XVII. a, a, show the basis of the brain,

freed from the dura mater and laid on its hemispheres, and divided into four lobes b, b, c, c, and d, d.

e, The Infundibulum, having, behind it, two white protuberances, f, f.

g, g, g, The annular process, or pons Varolii, and beginning of the Medulla oblongata.

h, The Medulla oblongata, divided near its egress from the foramen occipitis.

i, Part of the pia mater, where it seems double between the annular protuberance, and Medulla oblongata.

k, k, l, l, o, o, The cerebellum covered with the pia mater.

m, A section of the cerebellum; showing, n, the arborescent distribution of its blood vessels.

p, p, Injected trunks of the carotid arteries.

p, *p*, Trunks of the cervical artery, connected with the preceding by the communicant branches.

q, r, s, The olfactory nerves.

t, t, The optic nerves; showing their conjunction at v, and at w, w, their trunks cut off at their egress from within the skull.

x, x, The third pair of nerves, called oculorum motorii.

y, y, The upper and fore part of the processus annularis.

z, z, The pathetici, or fourth pair of nerves.

a, *a*, The fifth pair of nerves.

b, *b*, The sixth pair of nerves.

c, *c*, *d*, *e*, The seventh pair.

h, *h*, The spinal accessory nerves.

r, *r*, Beginnings of the ninth pair of nerves.

i, *i*, *k*, *k*, The tenth pair, or first of the neck.

Plate XVIII. shows the internal structure of the brain, with part of the medulla oblongata.

a, a, Part of the dura mater expanded, showing at + part of the falx.

b, b, Part of the brain, divided transversely, to show, at d, d, and e, e, its cortical and medullary substances.

f, *f*, The hindmost part of the cerebrum, which rested on the second process of the dura mater.

f, g, h, The right and left ventricles of the brain laid open, showing the vessels of the pia mater which line them. f, Their superior and anterior parts which diminish towards their inferior and posterior parts, g.

h, h, The corpus callosum.

i, k, The roots of the fornix.

l, The Thalamus nervi optici of the right side, that of the left not being lettered.

m, The corpus transversale of the corpus callosum.

n, n, Parts of the corpora striata.

o, o, The nates.

p, p, The testes.

q, The glandula pinealis in situ.

r, r, The plexus choroides, consisting of blood-vessels.

s, s, The first process of the cerebellum, going to the nates.

t, A transverse process, joining the two pathetic nerves, and last mentioned process.

v, v, The nervi pathetici.

w, w, Two processes of the spinal marrow which compose the sides of the fourth ventricle.

x, y, z, The meditullium of the cerebellum, of an arborescent appearance, being divided transversely.

a, *b*, *a*, *b*, &c. The dura mater, which incloses the spinal marrow, divided transversely.

c, The pia mater, as yet inclosing the spinal marrow, concerning which see other particulars under the article Medulla Spinalis.

The *affections of the brain from external violence* form a copious subject of enquiry; and these divide themselves into several heads. See the articles Skull, Fissure, Depression, &c. When the brain is *compressed*, a set of symptoms ensue extremely dangerous, though sometimes they do not make their appearance till after a considerable interval. See Compression. But at whatever time they appear, they are uniformly of the same kind, and are in general as follow: drowsiness, giddiness, and stupefaction, dimness of sight, dilatation of the pupil; and, where the injury done to the head is great, there is commonly a discharge of blood from the eyes, nose, and ears. Sometimes the fractured bone can be discovered through the integuments, at others it cannot. There is an irregular and oppressed pulse, and snoring or apoplectic stertor in breathing. There is likewise nausea and vomiting, with an involuntary discharge of fæces and urine. Among the muscles of the extremities and other parts there is loss of voluntary motion, convulsive tremors in some parts of the body, and palsy in others, especially in that side of the body which is opposite to the injured part of the head.

Some of the milder of these symptoms, as vertigo, stupefaction, and a temporary loss of sensibility, are frequently induced by slight blows upon the head, but commonly soon disappear, either by rest alone, or by the means to be afterwards pointed out. But when any other symptoms ensue, such as dilatation of the pupils, and especially when much blood is discharged from the eyes, nose, and ears, and there is an involuntary discharge of fæces and urine, it may be reasonably concluded that compression of the brain is induced.

The cavity of the cranium, in the healthy and natural state, is every where completely filled by the brain; whatever therefore diminishes that cavity, will produce a compression of the brain. The causes producing such a diminution may be of various kinds, as, fracture and depression of the cranium; the forcible introduction of any extraneous body into the cavity of the cranium; effusion of blood, serum, pus, or any other matter; the thickness of the bones of the cranium in certain dis-

eases, as in lues venerea, rickets, or spina ventosa; or water collected in hydrocephalous cases. The first set of causes shall be considered in their order. The four last mentioned belong to the province of the physician, and have been considered under their particular names.

The brain may also be injured very materially by the mere jolting or violent shaking of its parts, although there be no permanent mechanical pressure. This injury of the head is denoted by peculiar symptoms, which are described under CONCUSSION.

Inflammation of the brain and its membranes is attended with symptoms which occur in inflammation affecting other parts of the body, and from similar causes, and likewise with symptoms peculiar to the brain itself. This disorder differs essentially from concussion, in its not appearing immediately; seldom till several days after the accident, and sometimes not till two, three, or more weeks, or even as many months, have elapsed: when the patient begins to feel an universal uneasiness over his head, attended with listlessness, with a degree of pain in the part upon which the injury was inflicted, though of this there was perhaps no previous sensation. These symptoms gradually increase; the patient appears dull and stupid; there is now a sensation of fulness, as if the brain were girt or compressed; he complains of giddiness and of nausea, which sometimes terminate in vomiting; he is hot, and extremely uneasy; his sleep is much disturbed, neither natural sleep nor that procured by opiates affording him relief; the pulse is hard and quick; the face is flushed; the eyes inflamed, and unable to bear an exposure to much light. Sometimes, where a wound of the head accompanies these symptoms, its edges become hard and swelled, and an erysipelatous inflammation spreads quickly over the whole head, and especially towards the forehead and eyelids, which frequently swell to such a degree as to shut up the eyes entirely. This swelling is soft and painful to the touch; it receives the impression of the finger, and frequently originates merely from the external wound; on which account the attending symptoms are commonly easily removed by the means best suited to erysipelas of the parts. In a few instances, however, this symptom is likewise connected with, and seems to originate from, some affection of the dura mater. Its tendency is then of the most dangerous kind, and therefore requires the greatest attention. Soon after these symptoms become formidable, the part which received the blow begins to put on a diseased appearance. If the bone has been exposed by the accident, it now loses its natural complexion, becomes pale, white, and dry, either over its whole surface or in particular spots: but when the bone has not been denuded, nor the softer parts divided, but merely contused, they now swell, become puffy, and painful to the touch: and when the head is shaved, the skin over the part affected is redder than the rest of the scalp; and if the swelled part be laid open the pericranium will probably be found to be detached from the skull, and a little bloody fœtid ichor will be observed between this membrane and the bone, which will be found discoloured in nearly the same manner as if it had been laid bare from the beginning.

By the application of proper remedies these symptoms are frequently entirely removed; but when neglected, or when they do not yield to the means employed, they constantly become worse. Delirium ensues; the patient becomes extremely hot; and is at times seized with slight shiverings, which continue to increase, and are attended with some degree of coma or stupor. The former symptoms now, in a great measure, disappear; palsy of one side is soon followed by deep coma; the pupils are dilated; the urine and fæces are passed involuntarily; subsultus tendinum and other convulsions ensue; and death certainly follows, if the patient be not speedily relieved.

Of the above symptoms, the first set point out the inflammatory, the other the suppurative, stage of the disease. The remedies which are useful in the one are highly improper in the other. During the inflammatory stage, blood-letting is the principal remedy; but this is improper after the suppurative symptoms appear, for then the trepan is the only thing that can give relief.

The *indications of cure* are; 1. To employ the most effectual means for preventing inflammation. 2. To endeavour to procure the resolution of inflammation by general and topical remedies. 3. When the inflammation cannot be removed by resolution, and when suppuration has taken place, to give a free vent to the matter. 4. If the affected parts be attacked with gangrene, to endeavour to remove it and obviate its effects.

To answer the *first* indication, when the contusion is considerable, *blood-letting*, both general and topical, ought to be employed, and to a considerable extent; the bowels ought to be kept open by the use of laxatives; a watery solution of cerussa acetata should be applied to the part affected, and a low diet, with a total abstinence from exercise, ought to be enjoined: but if these means fail, or, as frequently happens, the practitioner has not been called in soon enough for their proper application, and if inflammation have actually commenced, the second indication ought then to be attended to. For this purpose, blood-letting, not from the feet according to the advice of old practitioners, but as near as possible to the part affected, is to be performed, by leeching, or scarifying with a lancet or scalpel.

When instead of this, general blood-letting is

thought more advisable, it is commonly reckoned best to open the external jugular vein, or the temporal artery; and the rule, with regard to the quantity to be evacuated, ought to be, to draw blood as long as the pulse continues firm: so that, in violent cases, taking away from 20 to 25 ounces at once will be found to answer the purpose better than to extract even a larger quantity, but at different intervals. A few hours afterwards, if the symptoms continue violent, it may be proper to discharge an additional quantity; but this must depend upon the strength of the patient and the fulness of the pulse.

Along with the liberal use of blood-letting, *brisk purgatives* should be given. The bowels should not merely be kept open; but in order to receive full advantage from the practice, a smart purging should be kept up by repeated doses of calomel, jalap, or some neutral salt. Where the patient cannot swallow in sufficient quantity, stimulating injections should be frequently exhibited.

A moist state of the skin is useful in every case of inflammation, and ought, therefore, to be here particularly attended to. In general a mild perspiration may be induced by applying warm fomentations to the feet and legs, and by laying the patient in blankets instead of linen. But when these means are insufficient, diaphoretics or even sudorifics may be given, particularly antimonial wine with tincture of opium.

When much pain or restlessness takes place, opiates should be administered freely, which are now found to be attended with real advantage.

With respect to the external treatment of this disorder, attention should be paid to those means which may most readily induce a free discharge of purulent matter from the seat of the injury. With this view, if the original accident be attended with a wound or division of the integuments, as the lips of the sore are commonly observed to be hard, painful, and dry, it should be covered with pledgets spread with an emollient ointment, and warm emollient poultices laid over the whole; by which means, and especially by a frequent renewal of the poultices, a free discharge of matter will commonly be induced, and the bad symptoms will generally be much mitigated, or entirely removed.

In cases unattended with a division of the integuments, as soon as it is suspected that bad symptoms may supervene, the tumor should be divided down to the pericranium; and if that membrane be found separated from the bone, it ought likewise to be divided; and by inducing a suppuration in the way already mentioned, the inflammatory symptoms will probably be removed. As matter formed here is commonly of an acrid nature, and therefore apt to affect the bone, and by communication of vessels the membranes under it, instead of wasting time till fluctuation be distinctly perceived, a free incision should be made as soon as a tumor is observable. But this would be extremely improper in the treatment of tumors which immediately succeed to external injuries; for it often happens that such tumors disappear spontaneously, or by the use of astringent applications. It is only when a tumor attended with pain, appears, at a distant period, upon the spot where the injury was received, that it ought to be opened as soon as perceived.

The next part of the practice regards the remedies to be used when the disorder has either proceeded to suppuration, or when, on a removal of a portion of the cranium, the dura mater is observed to be sloughy, with a tendency to gangrene: and this includes the third and fourth indications of cure.

The suppurative state of the disease is known, by the inflammatory symptoms, instead of yielding to the remedies already advised, increasing in violence; and being succeeded by coma, dilatation of the pupils, a slow and full pulse, involuntary discharge of fæces and urine, palsy, and irregular convulsive motions, and especially when these symptoms are succeeded by fits of rigor and shivering.

The existence of matter within the cranium being ascertained, as no other remedy can be depended upon for removing it, the operation of the trepan should be immediately employed, and as many perforations ought to be made as may be sufficient for evacuating the matter. But if, after the skull is perforated, little or no matter appear between the bone and membranes; if the dura mater seem more tense than usual; this membrane is likewise to be opened, so as to give a free discharge to any matter which may be collected between the brain and its membranes.

When it is perceived that the dura mater has already become sloughy, with some tendency to gangrene, the greatest danger is to be dreaded. If mortification has commenced, there will be much reason to think that death will soon follow; but different instances have occurred of sloughs forming upon the dura mater, and of cures being made after these have separated. All that can be attempted is to keep the sores clean, to give a free discharge to the matter, to apply nothing but light easy dressings, and to give bark in as great quantities as the stomach can bear. If there be still some tendency to inflammation, the diet should be low and cooling, the patient should drink freely of whey or other diluent liquors, and the bowels should be kept moderately open: but if, on the contrary, the system be low and the pulse feeble, wine is the most effectual cordial.

Mr. Abernethy, in his surgical Essays has given some very pointed instances of *inflammation of the pia mater*. See Pia Mater, and Dura Mater.

Dr. Hunter has observed, that the principal parts of the medullary substance of the brain in idiots and madmen, such as the *thalami nervorum opticorum*, and *medulla oblongata*, are found entirely changed from a medullary to a hard, tough, dark coloured substance, sometimes resembling white leather.

CE'REBRUM ELONGATUM. See MEDULLA SPINALIS.

CEREFO'LIUM, CHERVIL; a species of Scandix.

CEREFO'LIUM HISPA'NICUM, the plant SWEET CICELY.

CE'REI, bougies. See BOUGIES.

CE'REI MEDICATI; medicated bougies. See BOUGIES.

CE'REUS, the torch-thistle. It is a species of CACTUS.

CERI'NTHE, HONEY-WORT; a genus in Linnæus's botany. He enumerates two species.

CE'RION, (from κηριον, *a honey-comb)*; a kind of ACHOR; but the mouths of the perforations are larger, resembling the cells of the honey-comb; whence the name.

CERO'MA, (κηρωμα), a term given by the ancient physicians to an unguent or cerate, though originally, it seems to have been given to a particular composition which the wrestlers used in their exercises; whence Juvenal calls one so anointed *Ceromaticus*, Sat. iii.

CEROPE'GIA, a genus in Linnæus's botany. He enumerates four species.

CEROPI'SUS, a plaster of pitch and wax. Of this the ancients made their *Dropaces*.

CE'RRIS, the small acorned Spanish oak, with prickly cups; a species of *Quercus*.

CERU'MEN, (dim. of *Cera*, wax); a thick, viscous, bitter, excrementitious humour, separated from the blood by proper glands placed in the *meatus auditorius*, or outer passage of the ear. The want of a free secretion of this, and also its accumulation and hardening in the ear, are common causes of deafness. See DEAFNESS.

CERU'SSA, (κηροεσσα; from κηρος, *wax*, or from *razaz*, Arab.); CERUSSE, or white lead. This preparation is described under the article lead. It is the acetous oxyd of lead; called in the new chemical nomenclature, *oxydum plumbi album acetatum:* it is sometimes employed medicinally, in form of powder and ointment, to children whose skin is fretted, but the use of it is dangerous, and there is great reason to believe that complaints of the bowels of children originate from its absorption.

Cerusse has a scaly or foliated texture, is brittle, friable, heavy, of a snowy whiteness, and a sweet taste. It is often adulterated with chalk, which may be discovered by mixing it with oil, and reducing the lead in a crucible. Although very friable, the coarser particles cannot be separated by sifting, because the interstices are soon filled up. It can only be obtained in the state of a fine powder, by rubbing a lump of cerusse on a sieve placed over a piece of paper. In pharmacy, this oxyd of lead is used in the composition of many ointments and plasters. The officinal preparations of it are:— *Cerussa acetata*, or *acetatis plumbi*, Lond. Edin. Dubl. *Ung. oxidi plumbi albi*, Edin. *Pulv. cerussæ comp.* Lond.

CERUSSA ACETA'TA; till of late years called *saccharum saturni*, or sugar of lead. This being an acetite of lead (see LEAD), it is therefore called *acetis plumbi* in the new chemical nomenclature.

Cerussa Acetata. Lond.

Take of Cerusse, one pound;
Distilled vinegar, one gallon and a half.

Boil the cerusse with distilled vinegar, until the latter become sufficiently saturated; then filter the vinegar through paper, and, after due evaporation, set it to crystallise.

In the Edinburgh Dispensatory, the following method is directed:

Acetatis Plumbi. Edin.

Put any quantity of cerusse into a cucurbit, and pour thereon ten times the quantity of distilled vinegar. Digest them together for some days in a sand-heat, till the vinegar has acquired a sweetish taste, when it is to be suffered to settle, and then poured off. Add fresh vinegar to the remainder, and repeat this process till the menstruum no longer extracts any sweet taste. Let all the impregnated liquors rest for some time: and, after they have been poured from the fæces, evaporate them in a glass vessel, to the consistence of thin honey; so that, upon being set in a cool place, the sugar may shoot into crystals, which are afterwards to be dried in the shade. Exhale the remaining liquor to a pellicle, set it again in the cold, and more crystals will shoot. Repeat this operation till no crystals can be any longer obtained.

Cerusse (especially that sort called *flake lead*; which is not, like the others, subject to adulteration) is much preferable either to minium or litharge, for making this preparation of lead; because the corrosion, which it has already undergone from the steam of vinegar, disposes it to dissolve more readily. It should be finely powdered before the vinegar is put to it, and during the digestion, or boiling, every now and then, stirred with a wooden spatula, to promote its dissolution, and prevent its concreting into a hard mass at the bottom. The strong acid, obtained from the caput mortuum of

vinegar, may be employed for this process to better advantage than the weaker, though purer acid, before directed. If a small quantity of rectified spirit of wine be prudently added to the solution as soon as it is duly exhaled, and the mixture suffered to grow cold by slow degrees, the salt will concrete into very large and transparent crystals, which are scarcely to be obtained by any other method.

The crystals are ordered to be dried in the shade, because, if they are exposed to the sun-shine, they acquire a blackish colour; soon lose their saline condition, and the lead gradually assumes its metalline form: and this is supposed to happen from the absorption of light, and its conversion into phlogiston.

The internal use of this preparation, notwithstanding the rash encomiums which have been occasionally bestowed on it, is exceedingly dangerous. As a topical remedy, it has the properties of other solutions of lead, and is also liable to the same objections. See the articles LEAD and LITHARGYRUS.

CERVA'RIA, larger parsley-leaved mountain carrot; a species of ATHAMANTA.

CERVIA'NA, a species of PHARNACEUM.

CERVICAL, (*cervicalis;* from *cervix*, the neck); belonging to the neck; as cervical arteries, cervical nerves, cervical muscles, &c.

CERVICAL ARTERY. This rises from the upper side of the subclavian, and is presently afterwards divided into two, which come out sometimes separately, sometimes by a small common trunk. The largest of these two arteries is anterior, the other posterior.

The *anterior cervicalis*, running behind the carotid of the same side, is distributed to the musculus coraco-hyoidæus, mastoidæus cutaneus, sterno hyoidæus, and sterno thyroidæus, to the jugular glands, the aspera arteria, the muscles of the pharynx, bronchia, œsophagus, and to the anterior muscles which move the neck and head. This artery has been observed to send out the intercostalis superior.

The *posterior cervicalis* arises sometimes a little after the vertebralis, and sometimes from that artery. It passes under the transverse apophysis of the last vertebra of the neck; and sometimes through a particular hole in that apophysis; and from thence runs up backward in a winding course, on the vertebral muscles of the neck, and then returns in the same manner.

This artery communicates with a descending branch of the occipital artery, and with another of the vertebral artery above the second vertebra. It is distributed to the *musculi scalcni*, *angularis scapulæ*, and *trapezius*, and to the jugular glands and integuments.

CERVICAL VERTEBRÆ, the seven uppermost of the vertebræ which form the spine. They are distinguished from the rest by these marks: their bodies are smaller and more solid than any others; and flatted on the fore-part, to make way for the œsophagus; or rather this flat figure is owing to the pressure of the canal, and to the action of the longi colli and anterior recti muscles. They are also flat behind, where small processes rise, to which the internal ligaments are fixed. The upper surface of the body of each vertebra is made hollow, by a slanting thin process which is raised on each side: the lower surface is also hollowed, but in a different manner, for here the posterior edge is raised a little, and the anterior one is considerably produced. Hence we see how the cartilages between those bones are firmly connected, and their articulations are secured.

The cartilages between these vertebræ are thick, especially at their fore-part; which is one reason why the vertebræ advance forward as they descend, and have larger motion. The oblique processes of these bones more justly deserve that name than those of any other vertebræ. They are situated slanting; the upper ones having their smooth and almost flat surfaces facing obliquely backwards and upwards, while the inferior oblique processes have these surfaces facing obliquely forwards and downwards.

The transverse processes of these vertebræ are framed in a different manner from those of any other bones of the spine: for, besides the common transverse process rising from between the oblique processes of each side, there is a second one that comes out from the side of the body of each vertebra; and these two processes, after leaving a circular hole for the passage of the cervical artery and vein, unite, and are considerably hollowed at their upper part, with rising sides, to protect the nerves that pass in the hollow; and at last each side terminates in an obtuse point, for the insertion of muscles.

The spinal processes of these cervical bones stand nearly straight backwards, are shorter than those of any other vertebræ, and are forked or double at their ends; and hence allow a more convenient insertion to muscles.

The thick cartilages between the bodies of these vertebræ, the obliquity of their oblique processes, and the shortness and horizontal situation of their spinal processes, all conspire to allow them large motion. The holes between the bony cross bridges, for the passage of the nerves from the spinal marrow, have their largest share formed in the lowest of the two vertebræ, to which they are common.

So far most of the cervical vertebræ agree; but they have some particular differences, which oblige us to consider them separately.

1. The first, from its use of supporting the head, has the name of *atlas* (see ATLAS); and is also called *epistrophea*, from the motion it performs on the second. It has little or no spinal process; but,

instead of it, there is a large bony arch, that the muscles which pass over this vertebra at that place might not be hurt in extending the head. On the back and upper part of this arch there are two depressions, where the recti postici minores take their rise; and at the lower part are two other sinuosities, into which the ligaments that connect this bone to the following one are fixed.

The superior oblique processes of this atlas are large, oblong, hollow, and more horizontal than in any other vertebra. They rise more in their external than internal brim; by which their articulations with the condyloid processes of the os occipitis are firmer. Under the external edge of each of these oblique processes is the fossa, or deep open channel, in which the vertebral arteries make the circular turn, as they are about to enter the great foramen of the occipital bone, and where the tenth pair of nerves go out. In several bodies Dr. Monro says he has seen this fossa covered with bone. The inferior oblique processes, extending from within outwards and downwards, are large, concave, and circular. So that this vertebra, contrary to the other six, receives the bones with which it is articulated, both above and below.

The transverse processes here are not much hollowed or forked; but are longer and larger than those of any other vertebra of the neck, for the origin and insertion of several muscles; of which those that serve to move this vertebra on the second have a considerable lever to act with, because of the distance of their insertion from the axis of revolution.

The hole for the spinal marrow is larger in this than in any other vertebra, not only on account of the marrow being largest here, but also to prevent its being hurt by the motions of this vertebra on the second one. This large hole, and the long transverse processes, make this the broadest of the cervical vertebræ.

The condyles of the os occipitis move forwards and backwards in the superior oblique processes of this vertebra; but from the figure of the bones forming these joints, it appears, that very little motion can here be allowed to either side; and there must be still less circular motion.

In new born children this vertebra has only the two lateral pieces ossified; the arch, which it has at its fore-part instead of a body, being cartilaginous.

2. The second cervical vertebra is called *dentata*, from the tooth-like process on the upper part of its body. The body of this vertebra is somewhat of a pyramidal figure, being large, and produced downwards, especially at its fore-side, to enter into a hollow of the vertebra below; while the upper part has a square process, with a small point standing out from it. This it is that is imagined to resemble a tooth, and has given name to the vertebra. The side of this process, on which the hollow of the anterior arch of the first vertebra plays, is convex, smooth, and covered with a cartilage; and it is of the same form behind, for the ligament, which is extended transversely from one rough protuberance of the first vertebra to the other, and is cartilaginous in the middle, to move on it. A ligament likewise goes out in an oblique transverse direction, from each side of the processus dentatus, to be fixed at its other end to the first vertebra, and to the occipital bone; and another ligament rises up from near the point of the process to the os occipitis.

The superior oblique processes of the vertebra dentata are large, circular, very nearly in an horizontal position, and slightly convex, to be adapted to the inferior oblique processes of the first vertebra. The inferior oblique processes of this answer exactly to those common to all the cervical vertebræ.

The transverse processes are short, very little hollowed at their upper part, and not forked at their ends; and the canals through which the cervical arteries pass are reflected outwards about the middle substance of each process; so that the course of these vessels may be directed towards the transverse processes of the first vertebra. Had this curvature of the arteries been made in a part so moveable as the neck is, while they were not defended by a bone, and fixed to that bone, scarce a motion could have been performed without the utmost hazard of compression, and a stop put to the course of the blood, with all its train of bad consequences. Hence we observe this same mechanism several times used, when there is any occasion for a sudden curvature of a large artery. This is the third remarkable instance we have seen of it. The first was the passage of the carotids through the temporal bones; and the second was that lately described in the vertebral arteries, turning round the oblique processes of the first vertebra, to come at the great hole of the occipital bone.

The spinal process is thick, strong, and short, to give sufficient origin to the *musculi recti majores* and *obliqui inferiores*, and to prevent the contusion of these and other muscles in pulling the head back.

When we are acquainted with the structure and articulations of the first and second cervical vertebræ, and know exactly the strength and connection of their ligaments, there is no difficulty in understanding the motions that are performed upon, or by, the first; though this subject was formerly a matter of dispute amongst anatomists.

3. The third vertebra of the neck is by some called *axis;* but Dr. Monro thinks this name is applied to it with much less reason than to the second. This third vertebra, and the three below,

have nothing particular in their structure, each of them is larger as they descend. The seventh vertebra of the neck is near to the form of those of the back, having the upper and lower surfaces of its body less hollow than the others: The oblique processes are more perpendicular; neither spinal nor transverse processes are forked. This seventh and the sixth vertebra of the neck have the hole in each of their transverse processes more frequently divided by a small cross bridge, that goes between the cervical vein and artery, than any of the other vertebræ.

CERVICA'LIS DESCE'NDENS. This name is given to a fleshy slip which runs from the upper part of the *sacro-lumbalis* muscle into the fourth, fifth, and sixth transverse processes of the vertebræ of the neck, by three distinct tendons. Its use is to turn the neck obliquely backwards, and to one side.

CE'RVIX, properly denotes the hind part of the neck; as contradistinguished from the forepart, which is called *jugulum*, or the throat. The Cervix of the *scapula*, denotes the head of the shoulder-blade, or that upper process whose sinus receives the head of the humerus. The *Cervix uteri*, is the neck of the uterus; or that part of it which is situated immediately above or beyond the *os tincæ*.

CE'STRUM, bastard jasmine; a genus in Linnæus's botany. He enumerates four species.

CE'STRUM, a name for Betony.

CETACEOUS, an appellation given to the fishes of the whale kind, the characters of which are: they have no gills; there is an orifice on the top of the head, through which they breathe and eject water; and they have a flat horizontal tail. Nature on this tribe has bestowed an internal structure in all respects agreeing with that of quadrupeds; and in a few others the external parts in both are similar. Cetaceous fish, like land animals, breathe by means of lungs, being destitute of gills. This obliges them to rise frequently on the surface of the water to respire, to sleep on the surface, as well as to perform several other functions. They have the power of uttering sounds, such as bellowing and making other noises denied to genuine fish. Like land animals they have warm blood, are furnished with organs of generation, copulate, bring forth, and suckle their young, showing a strong attachment to them. Their bodies beneath the skin are entirely surrounded with a thick layer of fat, which we call *blubber*, analogous to the lard on hogs. The number of their fins never exceeds three, viz. two pectoral fins, and one back fin; but in some species the last is wanting. Their tails are placed horizontally, or flat in respect to their bodies; contrary to the direction of those of all other fish, which have them in a perpendicular site. This situation of the tail enables them to force themselves suddenly to the surface of the water to breathe, which they are so frequently constrained to do. Many of these circumstances induced Linnæus to place this tribe among his *mammalia*, or what other writers call *quadrupeds*. To have preserved the chain of beings entire, he should in this case have made the genus of *phocæ* or *seals*, and that of the *trichecus* or *manati*, immediately precede the whale, those being the links that connect the mammalia or quadrupeds with the fish: for the seal is, in respect to its legs, the most imperfect of the former class; and in the manati the hind feet coalesce, assuming the form of a broad horizontal tail. Notwithstanding the many parts and properties which cetaceous fish have in common with land animals, yet there still remain others which render it more natural to place them, with Ray, in the rank of fish: the form of their bodies agrees with that of fish; they are entirely naked, or covered only with a smooth skin; they live constantly in the water, and have all the actions of fish.

CE'TE, the name of Linnæus's seventh order of mammalia, comprehending the Monodon, Balæna, Physeter, and Delphinus.

CETERACH, (supposed to be corrupted from *Pteryga*, πτηρυξ); the *Scolopendria vera*, spleenwort, or Miltwaste. It is a small bushy plant, the *Asplenium ceterach; frondibus pinnatifidis, lobis alternis confluentibus obtusis*, Linn. It grows upon old walls and rocks, has an herbaceous, mucilaginous, roughish taste, and is recommended as a pectoral medicine. In Spain, Dr. Hooper says, it is given with great success in nephritic and calculous diseases.

CEVADI'LLA, (dim. of *ceveda*, Span. barley). It has the different names of *Cevadilla hispanorum*, *Sevadilla*, *Sabadilla*, and *Hordeum causticum*, caustic barley. The plant, whose grain is thus denominated, is a species of *veratrum* which grows in the Indies. They are powerfully caustic, and are administered with very great success as a vermifuge remedy.

CEYENNE PEPPER. See Capsicum.

CHAA, a Chinese name for *Tea*.

CHÆREFO'LIUM. See Cerefolium.

CHÆROPHY'LLUM, (χαιροφυλλον; from χαιρο *to rejoice*, and φυλλον, *a leaf;* so called from the abundance of its leaves), chervil; a genus of the digynia order, belonging to the pentandria class of plants. There are seven species, two of which, called *cow-weed* and *wild chervil*, are weeds common in many parts of Britain. The roots of the first have been found poisonous when used as parsnips. It ought to be rooted out from all pastures, as no animal but the ass will eat it. It is one of the most early plants in shooting, so that by the beginning of April the leaves are near two feet

high. The leaves have been thought aperient and diuretic, but it has been rejected by the Pharmacopœias.

CHÆROPHY'LLUM SYLVE'STRE. See CICUTARIA.

CHACARI'LLÆ CORTEX. See CASCARILLA.

CHAJOTLI, or CHAYOTI, a Mexican fruit of a round shape, and similar in the husk with which it is covered, to the chesnut, but four or five times larger, and of a much deeper green colour. Its kernel is of a greenish white, and has a large stone in the middle, which is white, and like it in substance. It is boiled, and the stone eaten with it. This fruit is produced by a twining perennial plant, the root of which is also good to eat.

CHA'LAZA, a white knotty sort of string at each end of an egg, formed of a plexus of the membranous fibres whereby the yolk and white are connected together. See EGG.

CHALA'ZIUM, or CHALAZION, (from χαλαζα, *a hail-stone)*; a species of the hordeolum. It is that well-known affection of the eye called a *Stye*, or *Stian;* a moveable schirrous tumor on the margin of the eye-lid, resembling a hail-stone, whence its name. It is white, hard, and encysted; and differs from the *crithe*, another species, only in being moveable. It continues long, and proceeds slowly. Sometimes it may be dispersed with the ung. hydrarg. or by electricity. In some cases it may be necessary to make an incision through the skin which covers them, and dissect the tumor out, or else to touch the skin over them with caustic; then either press the tumor out, or touch it until the whole is wasted. Commonly, however, they fall into a slow suppuration naturally, and are usually inflamed and painful in consequence of the motions of the eye-lid.

CHA'LBANE, a name for galbanum.

CHA'LCAS, a genus in Linnæus's botany. There is but one species.

CHA'LCEDONICUM, Chalcedonian martagon; a species of LILIUM.

CHALCE'DONY, a genus of the semi-pellucid gems. It is of an even and regular, not tabulated structure; of a semi-opaque and crystalline basis, and variegated with different colours. Some are disposed in form of mists or clouds, and, if nicely examined, seem to be owing to an admixture of various coloured earths, but imperfectly blended in the mass, and often visible in distinct moleculæ. It has been doubted by some whether the ancients were at all acquainted with this stone. All the species of chalcedony readily give fire with steel, and make no effervescence with nitrous acid.

CHALCE'ION, a species of PIMPINELLA.

CHALCI'TIS, (from χαλκος, *brass)*, a metalline substance, found in the veins of copper. Dr. Alston says it is one of the desiderata, and that its succedaneum is the colcothar vitrioli, or vitriolated iron calcined to redness.

CHALCOIDE'UM OS, a name for the os cuneiforme of the tarsus.

CHALK. See CRETA and LIME. Pure chalk is formed by the union of the carbonic acid with lime. It is much used as an absorbent and antacid medicine, to stop diarrhœas, which are accompanied with acidity of the primæ viæ.

CHALK-STONES, a name given to the concretions of calcareous matter in the hands and feet of people violently afflicted with the gout. Leuwenhock has been at the pains of examining these by the microscope, but his distinctions have not led to any thing useful with regard to the disease which produces them.

CHALYBEATE, (from *chalybs*, steel); a medicine which contains steel. This appellation is given adjectively to any liquids, as wine or water, impregnated with particles of steel. It is now, however, getting into disuse, the epithet *ferruginous* being more accurate in such cases. Steel possesses no medicinal properties which are not common to iron, and indeed it is scarcely ever the impregnating substance, or material employed. See IRON. This class of remedies has been, by some writers, supposed to differ according to the nature of the acid united with the metal: thus, "vegetable acids," it is said, "impart to them a detergent and aperient virtue; when combined with the vitriolic acid, they operate on the first passages as powerful aperients; the nitrous acid renders them very styptic, and the muriatic produces the same effect, in the highest degree." The use of chalybeates has, occasionally, been attended with great success, when united with cathartics, especially in cases of chlorosis, pains of the stomach, and palpitations of the heart; but they should not be resorted to indiscriminately; since they are extremely precarious for plethoric, or very irritable constitutions, and sometimes produce dangerous effects.

CHALYBEATE WATERS, such mineral waters as chiefly abound with iron. These are the waters of Tunbridge, Spa, Pyrmont, Cheltenham, Scarborough, Hartfel, and many others. See IRON and MINERAL WATERS.

CHA'LYBIS RUBIGO PRÆPARATA. See RUBIGO FERRI.

CHA'LYBS, (from *Chalybes*, a people in Pontus, who dug iron out of the earth); steel. See STEEL.

CHAMÆ'DRYS, (χαμαιδρυς; from χαμαι, *the ground*, and δρυς, *the oak:* so called from its leaves resembling those of the oak); GERMANDER. This plant is the *Teucrium chamædrys; foliis cuneiformi-ovatis, incisis, crenatis, petiolatis; floribus ternis; caulibus procumbentibus, subpilosis*, Linn. It has a moderately bitter and somewhat aromatic

taste. It was in high repute amongst the ancients in intermittent fevers, rheumatism, and gout; and where an aromatic bitter is wanting, germander may be administered with success. Though rejected by ours, it is still recognised in some of the foreign Pharmacopœias. Germander is one of the ingredients in the once celebrated Portland powder. See PORTLAND POWDER.

CHAMÆ'LEON ALBUM, the same as *Carlina* and *Cardopatium;* CARLINE THISTLE. It is the *Carlina acaulis; caule unifloro, flore breviore*, Linn. The root of this plant is bitter, and said to possess diaphoretic and athelmintic virtues. It is rejected by our colleges, but still employed by foreign physicians in the cure of acute, malignant, and chronic disorders.

CHAMÆME'LUM, (χαμαιμηλον; from χαμαι, *the ground*, and μηλον, *an apple;* because it grows upon the ground, and smells like an apple); CHAMOMILE. *Anthemis nobilis; foliis pinnato-compositis linearibus acutis subvillosis*, Linn. Class, *Syngenesia*. Order, *Polygamia superflua*. It is a perennial plant, indigenous to the south of England, but often cultivated in gardens for the purposes of medicine. The flowers have a strong, not ungrateful, aromatic smell, but a very bitter nauseous flavour. They contain a bitter extract, and an essential oil. To the latter is to be ascribed their antispasmodic, cordial, and diaphoretic effects; to the former their influence in promoting digestion, and strengthening the system.

Neumann obtained from 480 parts of the flowers, 180 of alcoholic extract, and afterwards 120 by watery infusion; and, reversing the process, 240 were procured of watery, and 60 of alcoholic.

Chamomile flowers are a well-known and very excellent remedy: preparations of them are often used with advantage in spasmodic diseases, in hysteria, in spasmodic and flatulent colics, in suppression of the menses, in the vomiting of puerperal women, and in allaying the after-pains; also in gout, in intermittents, and in typhous fever. From its stimulating and rather unpleasant essential oil, chamomile also excites vomiting, when given warm in a weak infusion; and in this way it is often used to assist the action of ipecacuanha.

The flowers of chamomile are applied externally as a discutient and emollient to abate inflammation; also in the form of clyster or external fomentation, in the colic, dysentery, and strangulated hernia, &c.

When exhibited internally, the flowers may be given—1. In the form of powder, or of electuary, in doses of from half a drachm to two drachms, either alone, or combined with cinchona. This is proper for the cure of intermittent fevers. 2. In infusion, which may either be drunk warm, for promoting the action of emetics, or cold, as a stomachic. In the former case it should be weak, in the latter very strong. 3. In a decoction or an extract. These forms contain only the extractive matter, and therefore may be considered as simple bitters. 4. The essential oil, which is to be obtained by distillation. This last possesses the antispasmodic powers of chamomile in a higher degree than the simple flowers, but on the contrary, does not possess the bitter extract.

Dr. Cullen found them answer both in powder and in infusion the purposes of any other bitters. Before the introduction of cinchona, he says, they were much employed in the cure of intermittent fevers; and Dr. Pitcairn was of opinion, that their powers in this respect were equal to the bark. Hoffmann seems also to have thought them a very effectual, and at the same time a safer, remedy.

Dr. Cullen employed them agreeably to the method of Hoffmann, by giving, several times during the intermission, from half a drachm to a drachm of the flowers in powder; with which, he says, he cured intermittent fevers. He found, however, that these flowers were attended with this inconvenience, that, given in a large quantity, they readily ran off by stool, defeating thereby the purpose of preventing the return of paroxysms; and, indeed, without joining with them an opiate or an astringent, he could not commonly employ them. He observes, however, that this quality of chamomile in moving the intestines, renders them often useful in flatulent and spasmodic colic, when exhibited in the way of clyster; and, upon the same ground, he found them useful in dysentery, though rather hurtful in diarrhœa.

The London, Edinburgh, and Dublin Pharmacopœias, direct an infusion and an extract of chamomile.

CHAMÆME'LUM FLO'RE PLE'NO, the double chamomile; which is only a variety of the officinal chamæmelum, produced by culture.

CHAMÆME'LUM NO'BILE, common chamomile. See CHAMÆMELUM.

CHAMÆME'LUM VULGA'RE, also called *chamomilla nostras*. The plant directed under this name in the pharmacopœias, is the *matricaria chamomilla; receptaculis conicis; radiis patentibus; squamis calycinis, margine æqualibus*, Linn. Its virtues are similar to those of the chamæmelum, but in a much inferior degree, and therefore it is seldom used.

CHAMÆMO'RUS, (from χαμαι, *on the ground*, and μορεα, *the mulberry-tree);* cloud-berry, or KNOT-BERRY. The ripe fruit of this plant, the *rubus chamæmorus; foliis simplicibus lobatis, caule interni unifloro*, Linn. is prepared in Sweden, &c. into a jam; and is used to allay the symptoms in fevers, phthisical diseases, hœmoptysis, &c. This shrub grows on boggy mountains in England, and

other northern nations. The leaves resemble those of the mallow or of the currant-tree, and the fruit is like the raspberry. When ripe, it is sweet, tart, and of a yellowish red colour. It ripens in July and August.

CHAMÆ'PITYIS, (χαμαιπιτυς; from χαμαι, the *ground*, and πιτυς, the *pine-tree*); a low hairy plant; the *teucrium chamæpitys; foliis trifidis, linearibus, integerrimis; floribus sessilibus, lateralibus, solitariis, caule diffuso*, Linn. It is a low, hairy, creeping plant, with square stalks, whitish clammy leaves, cut deeply into three narrow segments, set in pairs at the joints, and yellow labiated flowers without pedicles, and wanting the upper lip. It is annual, grows wild in sandy and chalky grounds, in some parts of England; flowers in July and August, and has a long, slender, fibrous root. It has a moderately bitter taste, and an aromatic, not disagreeable smell, somewhat like that of the pine. Its tops or leaves are recommended as aperients and corroborants of the nervous system, and said to be particularly serviceable in female obstructions and paralytic disorders. It has been rejected, however, by the colleges.

CHAMÆROPS; a genus of the natural order of *palmæ*. The male is a distinct plant, the same as the hermaphrodite. There are two species, the most remarkable of which is the *glabra*, a native of the West Indies and warm parts of America, also of the corresponding latitudes of Asia and Africa. It never rises with a tall stem; but, when the plants are old, the leaves are five or six feet long, and upwards of two feet broad: these spread open like a fan, having many foldings, and at the top are deeply divided like the fingers of a hand. This plant the Americans call *thatch*, from the use to which the leaves are applied. Under the name of palmetto, however, Mr. Adanson describes a species of palm which grows naturally at Senegal, whose trunk rises from fifty to sixty feet in height: from the upper end of the trunk issues a bundle of leaves, which, in turning off, from a round head, each leaf represents a fan of five or six feet in expansion, supported by a tail of the same length. Of these trees some produce male flowers, which are consequently barren; others are female, and loaded with fruit, which succeed each other uninterruptedly almost the whole year round. The fruit of the large palmettos, Mr. Adanson affirms to be of the bigness of an ordinary melon, but rounder: it is inveloped in two skins as tough as leather, and as thick as strong parchment; within, the fruit is yellowish, and full of filaments fastened to three large kernels in the middle. The negroes are very fond of this fruit, which, when baked under the ashes, is said to taste like a quince. The little palmetto may be easily raised in this country from seeds brought from America.

CHAMÆSY'CE; a species of EUPHORBIA.

CHAMBERS OF THE EYE. The space between the capsule of the crystalline lens and the transparent cornea being divided by the iris; the space before the iris is termed the anterior chamber; and that behind it, the posterior. They are filled with a fluid called the aqueous humour. See EYE.

CHAMOMI'LLA NO'STRAS. See CHAMÆMELUM VULGARE.

CHAMOMI'LLA ROMA'NA. See CHAMÆMELUM.

CHAMPA'CA; a species of MICHELIA.

CHA'NCRE, (Fr.) a primary venereal ulcer on the parts of generation. Venereal ulcers commonly have one character, which however is not entirely peculiar to them, for many sores that have no disposition to heal, which is the case with a chancre, have so far the same character. A chancre has commonly a thickened base, and although in some the common inflammation spreads much further, yet the specific inflammation is confined to this base. The future, or consequent ulcers, are commonly easily distinguished from the original, or venereal.

Mr. Hunter observes, that there are three ways in which chancres are produced. 1. By the venereal poison being inserted into a wound. 2. By its being applied to a non-secreting surface; and, 3. By being applied to a common sore. To whichever of these three different surfaces it is applied, the pus produces its specific inflammation and ulceration, attended with a secretion of pus. The matter produced in consequence of those different modes of application is of the same nature with the matter applied, because the irritations are the same in both. The poison much more readily contaminates if it is applied to a fresh wound, than to an ulcer, in this resembling the inoculation of the small-pox.

This form of the disease, like the gonorrhœa, is generally caught on the parts of generation, in consequence of a connection between the sexes; but any part of the body may be affected by the application of venereal matter, especially if the cuticle be thin, as on the prolabium.

The penis, and particularly the prepuce, being the parts most commonly affected by this form of the disease, are so constructed as to suffer much from it, especially when they are very susceptible of such irritation; for the structure alone produces many inconveniences.

The chancre is not so frequent an effect of venereal poison as the gonorrhœa; and Mr. Hunter thinks very good reasons may be assigned for this. When the disease is caught it is commonly by the same mode of application with that of the gonorrhœa; but as the cuticle cannot be affected by the virus, this covering acting as a guard to the cutis, it is often prevented from coming in contact with it; and indeed it is almost surprising that the cutis

should ever be affected by it, where it has such a covering, excepting about the glans, the inside of the prepuce, or other parts of the body, where it is thin.

The proportion which the cases of gonorrhœa bear to those of chancre is as four or five to one. When it is caught in men, it is generally upon the frænum, glans penis, prepuce, or upon the common skin of the body of the penis; and sometimes on the fore part of the scrotum; but most frequently on the frænum, and in the angle between the penis and glans. Its affecting these parts arises from the manner in which it is caught, and not from any specific tendency these parts have to catch it more than others; and its affecting the frænum, &c. more frequently than the other parts of the penis, arises from the external form of this part, which is irregular, and allows the venereal matter to lie undisturbed in the chinks; by which means it has time to irritate, and inflame the parts, and to produce the suppurative and ulcerative inflammation in them. But as this matter is easily rubbed off from prominent parts, by every thing that touches them, it is a reason why such parts in general so often escape this disease.

The distance of time between its application and its effects upon the part is uncertain; but, upon the whole, it is rather longer of appearing than the gonorrhœa; however, this depends in some measure on the nature of the parts affected. If it be the frænum, or the termination of the prepuce into the glans that is affected, the disease will in general appear earlier; these parts being more easily affected than either the glans, common skin of the penis, or scrotum; for in some cases, where both the glans and prepuce were contaminated from the same connection, it has happened earlier on the prepuce.

A chancre begins first with an itching in the part; if it be on the glans penis, generally a small pimple appears full of matter, without much hardness, or seeming inflammation, and with very little tumefaction, the glans not being so readily tumefied from inflammation as many parts are, especially the prepuce; nor are the chancres attended with so much pain or inconvenience, as those on the prepuce. But if the frænum be the part affected, and more especially the prepuce, an inflammation more considerable than the former soon follows, or at least the effects of the inflammation are more extensive and visible. Those parts being composed of very loose cellular membrane, afford a ready passage for the extravasated juices. The itching is gradually changed to pain; the surface of the prepuce is, in some cases, excoriated, and afterwards ulcerates; in others, a small pimple or abscess appears, as on the glans, which forms an ulcer. A thickening of the part comes on, which at first, and while of the true venereal kind, is very circumscribed, not diffusing itself gradually and imperceptibly into the surrounding parts, but terminating rather abruptly. Its base is hard, and the edges a little prominent. When it begins on the frænum, or near it, that part is very commonly wholly destroyed, or a hole is often ulcerated through it, which proves rather inconvenient in the cure, and in general it had better, in such cases, be divided at first.

If the venereal poison has been applied to the external skin of the penis, or to the scrotum, where the cuticle is more dense than that of the glans or frænum, then it generally appears first in a pimple, which is commonly allowed to scab, owing to its being exposed to evaporation. This scab is generally rubbed off, or pushed off, and one larger than the first forms. Mr. Hunter supposes, that less inflammation attends these last than those on the frænum and prepuce, but more than those upon the glans.

When these chancres are forming, and after they are formed, or in the state of inflammation, it is no uncommon thing for the urethra to sympathise with them, and occasion a tickling pain, especially in making water; but whether there is ever a discharge in the urethra from such a cause, Mr. Hunter will not venture to determine. However, he says, it is possible, in those cases where a gonorrhœa is preceded by a chancre, that this gonorrhœa may arise from sympathy, and is not a disease proceeding from the original contamination, nor from the matter of the chancre. In consequence of the urethra sympathising with the chancre, the testicles and scrotum will sometimes further sympathise with the urethra, and become affected, so as even to extend over the whole pubes.

It is always necessary to pay some attention to the manner in which chancres first appear, and also to their progress; for they often explain the nature of the constitution at the time. If the inflammation spreads fast, and considerably, it shows a constitution more disposed to inflammation than natural. If the pain is great, it shows a strong disposition for irritation. It also sometimes happens, that they begin very early to form sloughs: when this is the case, they have a strong tendency to mortification. When there is a considerable loss of substance, either from sloughing or ulceration, a profuse bleeding is no uncommon circumstance, more especially if the ulcer is on the glans; for it would appear, that the adhesive inflammation does not sufficiently take place there to unite the veins of the glans so as to prevent their cavity from being exposed, and the blood is allowed to escape from the corpus spongiosum urethræ. The ulcers, or sloughs, often go as deep as the corpus cavernosum penis, where the same thing happens.

Women are also subject to chancres, but, from the simplicity of the parts, the complaint is often

less complicated than in men. For, in this sex, we have only the disease and constitutional affection, no inconvenience arising from the formation of the parts.

Chancres, Mr. Hunter asserts, as well as the gonorrhœa, are seldom or never wholly venereal; but varied by certain peculiarities of the constitution at the time. The treatment therefore of them, both local and constitutional, he says, will admit of great variety; and it is upon the knowledge of this variety, that the skill of the surgeon principally depends. On this account, the concomitant symptoms are what require particular attention. Mercury is the cure of the venereal symptoms abstractedly considered; but there is no one specific for the others, the treatment of which must vary according to the constitution. From hence we must see that no kind of medicine joined with mercury will be likely to succeed in all cases, although the different pretended secrets are of this kind. Some cases not requiring any thing except mercury, others requiring *a something besides*, according to their nature, which in many cases it will not be an easy matter to find out, from the appearances of the chancre itself, but which must be discovered by repeated trials.

Probably from the beforementioned circumstances it is, that a chancre is in common longer in healing than most of the local effects from the constitutional disease, or lues venerea; at least longer than those in the first order of parts; and this is found to be the case notwithstanding that the cure of a chancre may be attempted both constitutionally, and locally, while the lues venerea can only be cured constitutionally. It is commonly some time before a chancre appears to be affected by the medicine. The circulation shall be loaded with mercury for three, four, or more weeks, before a chancre shall begin to separate its discharge from its surface, so as look red, and show the living surface; but, when once it does discharge, its progress towards healing is more rapid. The syphilis shall in many cases be perfectly cured before chancres have made the least change.

Upon the same principle, some attention should be paid to internal medicines; and it should be considered, whether weakening, strengthening, or quieting medicines, should be given; for sometimes one kind, sometimes another, will be proper. Chancres admit of two modes of treatment; the object of one, is to destroy, or remove them by escharotics, or by extirpation; that of the other, is to overcome the venereal irritation by means of the specific remedy for that poison.

That chancres are local complaints, is confirmed by their being destroyed or cured by merely a local treatment. But in chancres, as well as in a gonorrhœa, it has been disputed whether mercury should ever be applied locally to them or not; some having objected to it, while others have practised it, and probably the dispute is not yet generally settled.

In the treatment we have two points in view. 1. The cure of the chancre itself. 2. The prevention of a contamination of the constitution. The first is be effected by mercury applied either in external dressings, or internally through the circulation, or in both ways. The second object is to be obtained, first by shortening the duration of the chancre, which shortens the time of absorption, and afterwards by internal medicine, which must be in proportion to the time that the absorption may have been going on.

If the quantity of virus absorbed is as the size of the chancre, and the time of absorption, which most probably it is, then whatever shortens the time must diminish that effect; and if the quantity of mercury necessary to preserve the constitution be as the quantity of poison absorbed, then whatever lessens the quantity absorbed must proportionally preserve the constitution.

The simplest method of treating a chancre is by destroying or extirpating it, whereby it is reduced to the state of a common sore or wound, and heals up as such. This only can be done on the first appearance of the chancre, when the surrounding parts are not as yet contaminated; because it is absolutely necessary that the whole diseased part should be removed, which is done with difficulty when it has spread considerably. It may be done either by incision or by caustic. If the chancre appears upon the glans, touching it with nitrated silver is preferable to incision, because the hæmorrhage by such a mode would be considerable, from the cells of the glans.

The common sensation of the glans is not very acute, therefore the caustic will give but little pain. The caustic to be used should be pointed at the end like a pencil, that it may only touch those parts that are really diseased: this treatment should be continued till the surface of the sore looks red and healthy after having thrown off the last sloughs; after it has arrived at this state, it will be found to heal like any other sore produced from a caustic. However, as our knowledge of the extent of the disease is not always certain; and as this uncertainty increases as the size of the chancre, it becomes necessary in some degree to assist the cure by proper dressings, and therefore it may be prudent to dress the sore with calomel or with quicksilver ointment.

From such treatment there is but little danger of the constitution being infected, especially if the chancre has been destroyed almost immediately upon its appearance, as we may then reasonably suppose there has not been time for absorption. But as it must be in most cases uncertain whether there has been absorption or not, this practice is

not always to be trusted to ; and from that circumstance perhaps never should ; and therefore even in those cases where the chancre has been removed almost immediately, it would be prudent to give some mercury internally. The quantity should be proportioned to the time and progress of the sore ; but if it has spread to a considerable size before extirpation, then mercury is absolutely necessary, and perhaps not a great deal is gained by the extirpation.

Where it is preferred to attempt the *cure of chancres by local applications*, Mr. Hunter gives us the following directions. He says, chancres may be cured in two different ways, either by external applications or internal applications through the circulation. The same medicine is necessary for both these purposes, namely mercury. As this however has no more power in curing the gonorrhœa than any other medicine, it might be supposed ineffectual in the present complaint ; but we find that in a chancre it is a specific, and will cure any one that is truly venereal : but as other dispositions take place, so other assistance is often necessary, as will be taken notice of under the article LUES VENEREA.

The action of this medicine must be the same in whatever way it is given, for its actions must be upon the vessels of the part, in one way acting only externally, in the other internally. For external local applications, mercurial ointments are the common dressings ; but if the mercury were joined with watery substances instead of oily, by mixing with the matter, the application would be continued longer to the sore, and would prove more effectual. This is an advantage that poultices have over common dressings. Mr. Hunter often used mercury rubbed down with conserve, instead of an ointment, and it answered, he says, extremely well. Calomel used in the same way, and also the other preparations of mercury mixed with mucilage or with honey, answer the same purpose. Such dressings will effect a cure, in cases that are truly venereal ; but perhaps we seldom find a constitution, so free from any tendency to some disease, as to be capable of taking on the venereal action simply by itself.

Some chancres will take on an indolent disposition, to counteract which the actions should be increased by joining with the mercury some warm balsam, such as bals. peruv. in a small proportion, or as much red precipitate as will only stimulate without acting as an escharotic ; and sometimes both may be necessary. Calomel mixed with some terebinthinate salve, or any other substance which will suspend it, is more active than common mercurial ointment, and in such cases as require stimulating applications it will answer better. Many other applications are employed by different surgeons, such as solutions of blue vitriol, verdigrease, calomel with the spiritus æther. nitros. and many others. But the parts affected are sometimes extremely irritable ; in such cases it will be necessary to mix the mercury with opium, or with some of the preparations of lead, as white or red lead, with a view to diminish the action of the parts. Sprinkling cerussa acetata on the chancre has, in some instances, answered very well.

The oftener the dressings are shifted the better, as the matter from the sore separates the application from the diseased parts, by which means the effects are lost or diminished. Three times every day, in many cases, is not oftener than necessary ; especially if the dressings are of the unctuous kind, for they do not mix like watery dressings with the matter, so as to impart some of their virtues to it, which would in a proportional degree affect the sore.

Chancres, after having their venereal taint corrected, often become stationary ; and having acquired new dispositions, increase the quantity of disease in the part. When they become stationary only they may often be cured by touching them slightly with nitrated silver. They seem to require that the surface which had been contaminated, or the new flesh which grew upon that surface should be either destroyed or altered before it can cicatrise ; and it is often surprising how fast they will heal after being touched, and probably once or twice may be sufficient.

Chancres which occasion, and are complicated with phymosis, require a particular treatment, which will be found under PHYMOSIS.

CHANTERELL'A FLA'VA GELATINO'SA. This is a sort of fungus, about an inch high, growing in clusters. Tournefort includes under this name all those fungi whose heads are solid, that is, neither lamellated, nor porous, nor latticed, nor prickly, nor turning to dust when ripe.

CHARCOAL. See CARBON.

CHASTE TREE. See AGNUS CASTUS.

CHEESE, a species of solid food, prepared from curdled milk cleared of the whey, and afterwards dried for use. As this article constitutes a material part of domestic consumption, we find in almost every country, one or more places celebrated for the superior quality of their cheese. The coagulation by which cheese is prepared, is effected by means of runnet (See RUNNET), and not by an acid as some have supposed. A quality belonging to every species of cheese is, that it is liable to putrefaction ; and by this it may be said that it approaches to the nature of animal substances. This opinion Dr. Cullen says, is confirmed by the matter of which cheese is formed, being, like animal substances, coagulated by acids, alcohol, and heat. It is true that the two latter, and even the mineral acids, do not act upon the coagulable part of milk in the same circumstances

and in the same manner as they do upon the serum of animal blood; but still they do act upon milk in a manner that shows a great similarity of the two subjects. The animal nature of cheese is especially confirmed by its yielding, in distillation, a volatile alkali. This indeed is a disputed fact; but Dr. Cullen not only assumes it upon the authority of some eminent chemists, but also upon actual experiment made under his own eye. Thus, a pound of skimmed-milk cheese, not in the least affected by putrefaction, was found to yield in distillation, first, a very pure water, very slightly acid; secondly, a liquor which effervesced strongly with the mineral acids; thirdly, an alkaline salt, concreting every where on the inside of the receiver; and, lastly, an empyreumatic oil.

The Doctor concludes, therefore, that the coagulable part of milk, is very much of the nature of animal substances; and if we adopt the common opinion, that milk is especially formed of the chyle of newly taken aliment, we shall readily perceive, that this must be always blended with the lymph which it meets with in its passage through the lacteals and thoracic duct; and we shall then also admit that this lymph makes a part, and particularly the coagulable part, of milk. We may conclude, therefore, that milk does contain a portion of animal matter; and at the same time, that the milk of animals feeding wholly, or for a great part, on vegetables, may be justly supposed to constitute an aliment of an intermediate kind between vegetable and animal.

"Cheese," says Dr. Cullen, "as employed in diet, is of very different kinds. It is hardly ever made of the substance formed by the spontaneous coagulation of milk, but of curd produced by the application of runnet; and the cheese thus produced is distinguished, in the first place, by the condition of the milk it is made of. Thus the runnet may be applied to entire milk, as it is drawn from the animal affording it; or it may be applied to that milk after it has been previously deprived of its cream; or it may be applied to the cream separated from the watery parts of the milk; or it may be applied to a portion of entire milk, to which is added a quantity of cream taken from another portion of the same milk: from which especially a considerable difference of cheese may arise from the different proportion of the coagulable and oily parts in the milk employed. Lastly, the milk employed may be that of one animal only; or it may be a mixture in different proportions of the several milks employed in our diet, but especially those of cows, goats, and sheep, the only milks from which cheese is prepared in this country.

"Besides these differences of cheese, arising from the state and quality of the milk employed, there are many other differences arising from the various practices employed in preparing it; as by the different circumstances of the coagulation; by the management of the coagulum or curd; by the pressure given to it; by the salting and drying; and by the manner in which it is afterwards preserved. These considerations will show the very great variety of cheese as it is presented upon our tables; but the causes of this variety it does not appear necessary for us to explain."

Cheese in its dried state is produced in various conditions; but its qualities may, nevertheless, be readily perceived. When it is made from milk previously deprived of its cream, it may be still a very nutritious matter, but of very difficult digestion, and fit only for the most robust persons; and even the difficulty of digestion may diminish the nourishment which it might otherwise afford.

Cheese made of entire milk must be a still more nourishing substance, and Dr. Cullen believes, of much easier digestion; and cheese made of entire milk, with a portion of cream taken from other milk added to it, will be still more nourishing, and hardly of less easy digestion, as the oily parts every where interposed between the parts of the gluten must render the adhesion of this less firm. As cheese is also made of cream alone, the qualities of this will be readily understood from what has been just now said.

"As cheese is employed," says Dr. Cullen, "not only when recent and fresh, but also under various degrees of a certain corruption it is liable to, so by this it acquires new qualities; and according to the degree of corruption, it becomes more acrid and stimulant, partly from the acrimony it has acquired by corruption, and partly by the great number of insects that are very constantly generated in it in that state. In this corrupted condition, cheese can hardly be taken in such quantity as to be considered as alimentary; and in what measure or manner it may be, as is commonly supposed, considered as a condiment, influencing the digestion of other food in the stomach, I cannot clearly explain."

One farther particular to be mentioned, is, that cheese is often eaten after having been toasted, or heated over the fire to a considerable degree; whereby a portion of its oil is separated, whilst the other parts are united more closely together. Many persons seem to digest this pretty well; but it is certainly not easily to be digested by a weak stomach: and for those who are subject to indigestion, or heated by a heavy supper, it is certainly improper.

CHEESE RENNET. See GALIUM LUTEUM.

CHEIRA'NTHUS, (χειρανθος; from χειρ, a *hand*, and ανθος, *a flower*; so named from the likeness of its blossoms to the human fingers); the WALL-FLOWER.

CHEIRA'NTHUS CHEI'RI; the systematic name for the wallflower. See CHEIRI.

CHEI'RI, (*Cheiri*, Arab.); the *Cheiranthus*

cheiri; foliis lanceolatis, acutis, glabris; ramis angulatis; caule fruticoso, Linn. The flowers are recommended as possessing nervine and deobstruent virtues, but their effects are too inconsiderable to deserve our notice. They have a moderately strong, pleasant smell, and a nauseous, bitter, somewhat pungent taste.

CHELÆ CANCRO'RUM. See CANCER.

CHELIDO'NIUM MAJUS, (χελιδωνιον μεγα, from χειδων, *a swallow*; so named from a notion, that it was pointed out as useful for the eyes by swallows, who are said to open the eyes of their young by it); CELANDINE. *Chelidonium majus; pedunculis umbellatis*, Linn. The herb and root of this plant have a faint, unpleasant smell, and a bitter, acrid, durable taste, which is stronger in the roots than the leaves. Both are recommended in the old dispensatories as being useful in icterus, cachexiæ, chlorosis, dropsies, &c. If employed, it should be administered with caution, as it is liable to irritate the stomach and bowels.

CHELIDO'NIUM MINUS, PILE-WORT; *Ranunculus ficaria; foliis cordatis angulatis petiolatis, caule unifloro*, Linn. The leaves and root are used medicinally. The former are deemed antiscorbutic; and the latter against the piles, in the form of a poultice.

CHELO'NE, a genus in Linnæus's botany. He enumerates five species.

CHELTENHAM WATER, a mineral spring, rising in the town of that name, in Gloucestershire, and celebrated for its medicinal properties.

This spring issues slowly, and in a scanty stream, from a bed of sand, intermixed with blue clay. The well is sunk about six feet deep, and excluded from communicating with the external air: its sides are covered with a yellow ochre, which indicates the nature of the water. When fresh drawn, Cheltenham water, though tolerably clear, is not perfectly transparent. It becomes more turbid by standing, and produces a small quantity of air-bubbles, emitting a slight, but easily perceptible smell, which increases on the approach of rain, is divested of any briskness, or pungency, but has a brackish, somewhat bitter, and chalybeate taste. Its temperature is, invariably, from fifty-three to fifty-five degrees. It contains, by the analysis of Dr. Rutty, thirty-six grains of earth, and 494 of salt, which was composed of vitriolated magnesia and a small quantity of sea-salt. Dr. Lucas found in it four grains of iron, 181½ grains of calcareous earth, mixed with a small portion of selenites, and 362½ of salt of the nature of Epsom. Dr. A. Fothergill makes the salt to be a native Glauber, mixed with a portion of Epsom salt. It is also one of the strongest chalybeates. The iron is suspended entirely by the carbonic acid, of which gas the water contains about an eighth of its bulk; but from the abundance of earthy carbonats and oxyd of iron, not much of it is uncombined.

The sensible effects produced by this water, when first taken into the stomach, are, generally, a degree of drowsiness, and sometimes headach; which, however, dissipate spontaneously, before it operates on the bowels. A moderate dose acts speedily as a cathartic, causes no griping, and leaves no languor: for this reason, and likewise on account of the salutary operation of the chalybeate, and, perhaps, of the carbonic acid, or fixed air, Cheltenham water may, as Dr. Saunders has remarked, be preserved for an indefinite length of time, without being productive of any inconvenience to the patient; and the use of it may improve the appetite, strengthen the organs of digestion, and invigorate the whole constitution.

This medicinal spring, when judiciously resorted to, has proved of considerable benefit in a variety of diseases, especially those of the chronic kind; in removing glandular obstructions, particularly such as affect the liver; in the restoration of those persons, whose biliary organs are injured by a long residence in hot climates, and who are suffering under the symptoms, either of excess, or deficiency of bile; and lastly, in dispelling some of the most distressing, and painful cutaneous affections, of the species usually denominated scorbutic.

Cheltenham water ought, however, to be taken with due precaution; for, though its ferruginous ingredient probably enables the constitution to support, without debility, a longer course of evacuation, than most other medicines of this kind, yet it cannot be used in every case, where a simple chalybeate is indicated. There are constitutions naturally languid, or debilitated by disease, so that they may be materially injured by a long-continued operation on the bowels. These saline waters, nevertheless, possess the peculiar advantage, that they may be used without any preparation. No other medicine is required, during their use, except the occasional addition of crystallized salts, of the same nature, where the water is not sufficiently laxative for costive habits; and likewise the use of the warm bath, particularly in cutaneous disorders.

The season for drinking Cheltenham water, is during the summer months; and, if possible, it should always be taken at the fountain head, and never kept long exposed to the air. It may, however, be cautiously warmed in close vessels, if, in a cold state, it should be offensive to the stomach of the patient.—Different circumstances will necessarily vary the extent of the dose; for which, half a pint of water is generally sufficient; and, if repeated three or four times, at proper intervals during the day, it seldom fails to produce a considerable aperient effect.

CHE'MA, (χημη); according to Blancard, a certain measure mentioned by the Greek physici-

ans, supposed to contain two spoonfuls. The Athenians had one of two drachms, and another of three.

CHEMICAL APPARATUS; a general expression denoting the instruments, vessels, machinery, furniture, and utensils of a laboratory; without which the labours of the chemical operator cannot be effectually performed. Amongst what we owe to the diligence of modern chemists, there is scarcely any weightier obligation, than that which has resulted from the simplifying the different processes, and improving the instruments and contrivances by which they are to be performed. So complete a revolution has, indeed, been effected in this respect, that the chemical apparatus now required is a new species of furniture, which totally supersedes the uncouth contrivances of former times.

Mr. Accum, in his excellent "System of Theoretical and Practical Chemistry," gives the following list of articles necessary for these pursuits:—1. A *portable universal furnace*, made of strong iron plates, lined with fire-bricks, calculated for all chemical operations whatever, which require the aid of heat. 2. Black lead *table furnaces*—Portable forges—Brass lamp-furnaces, with double cylindrical cottons and Argand lamp. 3. *Gazometers*, with glass bells, stop-cocks, &c. for collecting, and transferring gases. See GAZOMETER. Gas-holders—Pneumatic cisterns—Mercurial troughs, with sliding shelf and tray. 4. *Glass-receivers*, mounted with brass stop-cocks, for transferring gases into bladders, &c. Globular receivers and flasks, for weighing gases. 5. *Portable stills and refrigeratories* of tinned copper. Glass alembics. Retorts and receivers. 6. *Graduated detonating tubes* for firing gases, &c. Deflagrating jars—Improved blow-pipes of metal and glass, Eolipile blow-pipes. 7. *Spoons* of gold, silver, and platina. 8. Mortars of various kinds. 9. *Crucibles* of platina, gold, silver, cast iron, &c.—Muffles, cupels, and enamelling pans. Improved ingots and casting cones, evaporating basons—Guiton's tubes of safety—syphons—jointed conducting tubes—Graduated glass measures and cubic inches—Accurate balances and weights in decimals—Thermometers—Goniometers—Gravimeters—Galvanic batteries, piles, plates, &c.—Wollaston's apparatus for decomposing water by Galvanism, or electricity; are the instruments used in modern experimental chemistry.

The principal of these are delineated in pl. XIX. of which the following is a description:

Fig. 1. Is a table-furnace, formed of two large black-lead crucibles, *a. b.* The lower one, out of which the bottom is cut, and which is furnished with a grate, is fixed, into a circular support of strong sheet-iron, *c*, furnished with two handles for the convenience of removing it. This part of the furnace forms the ash-pit, and is furnished with a door. The upper crucible has a hole cut in its bottom, into which is inserted an iron tube, *d* (of which part is shown in the drawing), forming the chimney of the furnace, which may be elongated occasionally by an additional piece, so as to increase the draft at pleasure. In order to render this furnace less liable to accidents, a strong iron hoop, *e e*, is fastened round each of the crucibles, the lower of which serves to secure the junction of the two crucibles. In the upper and lower part of the furnace is cut a semi-circular opening for the introduction of charcoal or coke, according to the different processes carried on in the furnace; and the pieces of the crucible, thus removed, may serve as doors to the opening. If an iron sand-bath, with a rim (which is supplied with the furnace), be placed upon the lower crucible, the fuel of course must be introduced through the lower aperture; and thus those chemical processes may be performed, which do not admit of the direct application of the fire. But if a reverberatory furnace be required for distilling out of earthen ware, or coated glass retorts, or for applying an intense heat, to bodies capable of supporting a naked fire, a retort, crucible, &c. may then be introduced, and an intense heat obtained by feeding the furnace, through the opening in the upper crucible. The intensity of the fire may be regulated by means of the door in the ash-pit.

Fig. 2. Mr. Webster's lamp-furnace, with concentric wicks. It consists of a brass rod, about two feet nine inches high, screwed to a solid brass foot, loaded with lead. On this rod, slide three metallic sockets, with strait arms, to which are screwed brass rings of different diameters, for supporting glass retorts, evaporating basons, flasks, crucibles, &c. Each of these rings may, by means of a thumb-screw, be set at different heights. Below these rings is a fountain-lamp, on Argand's plan, which, by means of a thumb-screw, may also be elevated or depressed, in order to communicate more or less heat to the vessel suspended over it. By this ingenious contrivance, a double flame and more than double the heat of a common Argand's lamp may be obtained.

Fig. 3. Exhibits a detonating or eudiometer tube of glass. Its bore is about half an inch, and its height 18. It is graduated into cubic inches, and sub-divided into decimal parts. By means of the two conductors, *a a*, a quantity of gas, confined in the tube by water or mercury, may easily be inflamed by the electric spark. Hence this tube is extremely convenient for showing the production of water, nitrous acid, or to expose a confined quantity of gas to an intense heat.

Fig. 4. Is an improved, and highly useful, pneumatic mercurial trough, or tub. It consists of a mahogany box, of greater or less size, standing in a tray made of the same wood. The principal parts

of this apparatus are the shelf of the trough and the bottom. The reservoir, properly so called, is the interval between these two planes. The advantage of this apparatus consists in having a broad shelf, fixed on one of the sides of the trough, and a sliding shelf, with a hole in the centre, which communicates with a funnel-shaped opening on the side of the large shelf. Vessels placed on the sliding shelf, may be conveniently filled with gas, by directing the conveying tube of a gas-bottle, or the neck of a retort, into this excavation, and then sliding it on the large shelf of the apparatus; which, from being on one side of the trough, enables the operator to perform his experiments with a less quantity of mercury, and in an easier manner, than in the troughs of the usual construction. The tray, *b*, is useful for collecting the mercury which may be spilt.

Fig. 5. A portable universal furnace, made of strong wrought iron plates, and lined with fire-bricks laid in fire-proof loam. The body of the furnace is elliptical, its inner cavity however is in the figure of a cylinder. The height of this furnace without its chimney, *a a*, is two feet. The inner diameter of the cylindrical fire place measures nine inches. It is moveable upon castors. In the upper part of this furnace an iron sand-bath, *b*, is placed, which may occasionally be exchanged for a circular plate, and in that case the upper opening will serve for the introduction of the fuel. There are three openings in the front of this furnace, furnished with sliding plates, which move up and down, or backwards and forwards, and serve as doors. The lower opening, *c*, is the ash-hole of the furnace. In either of the upper openings a muffle may be introduced for the process of cupelation, or an iron retort, &c. (as shown in the drawing) may be inserted for the production of gases, which require high temperatures. In the side of the furnace a hole is cut, furnished with a stopper and door: by means of this opening a tube may be placed across the furnace for exposing different gazeous or other fluids to high temperatures. *This furnace is calculated for all chemical operations whatever, which require the aid of heat.*

Fig. 6. Dr. Gruber's conducting tubes. They consist of two metallic tubes joined to a metallic box consisting of two pieces, sliding in and over each other, made air tight by grinding. The one end of the tube (in the drawing) is joined to the retort placed in the furnace; the extremity of the other tube is extended into the pneumatic trough. The tubes may be elongated, by additional pieces, to any length required.

Fig. 7. A bell-glass, having a neck furnished with a brass cap, into which is screwed a stop-cock for transferring gases into flasks, bladders, &c. *a* is a small brass connecting piece, with two female screws, by means of which another stop-cock, fixed to a flask or bladder, may be connected with the stop-cock of the receiver.

Fig. 8. A flask for weighing gases. Its orifice is furnished with a brass cap and stop-cock. The flask is connected with a bell-glass in the manner stated before. If this flask has been previously exhausted by means of an exhausting syringe, and a communication be then made with the bell-glass by opening both cocks, the gas contained in the bell-glass may be transferred into the flask, by pressing down the bell-glass into the water of the pneumatic trough; the gas will then be forced up into the flask, the cocks being then shut, the flask may be removed, and is weight ascertained by means of a delicate ballance. The difference between the weights of the flask when exhausted, and when filled, give the weight of the gas in the flask, which may, by the same method, be compared to that of common air, &c. In a similar manner a bladder may be filled with gas, by tying its mouth to a stop-cock, and screwing it on that of the bell-glass.

Fig. 9. A perspective view of a pneumatic cistern. See Pneumatic Cistern.

Fig. 10. Burkitt's distillatory apparatus for impregnating fluids with gases, &c. *a*, Is a tubulated retort, joined to a tubulated receiver, *b*. From this a bent tube proceeds to the bottom of a second receiver, *g*, from the upper tubulature of which a communication is made, by means of a tube twice bent at right angles, with the two necked bottle, *i*. The principal advantage of this apparatus consists in a valve, constructed by placing a plano-convex lens upon the mouth of the small tube, accurately fitted by grinding, and inserted into the lower aperture of the receiver, *g*, and similar to the valve in the well known apparatus of Nooth, but with more water way. From this it becomes obvious that the gas disengaged from the retort, and not absorbed by the fluid contained in the receiver, *b*, will, by its upward pressure, raise the valve, and pass into the receiver, *g*, without allowing the fluid in that vessel to return into the receiver, *b*, even when a partial vacuum takes place in it. The gas which is not absorbed in the vessel, *g*, passes into the bottle, *i*, and if any part of the gas should escape absorption by the fluid in that vessel, it may be conducted into another bottle, after Woulfe's manner, or into the pneumatic trough, by means of the tube, *k*. In this manner, by a continued series of bottles and tubes, the whole of the disengaged gas may be absorbed.

A similar apparatus has been invented by Mr. Pepys, differing from the former, only by the vessel which contains the valve, being placed upon the first receiver.

Fig. 11. Exhibits Mr. Woulfe's improvement in the receiver in distillation. *a*. Is the retort. *b*. An

intermediate vessel, called an adopter, which is occasionally used. *c.* The receiver, having two necks; one at *d*, inserted into a bottle which receives the products which are usually condensed in the receiver; and the other at *e*, transmits the more volatile or aëriform products into a bason, *g*, containing water; beneath the surface of which the extremity of the neck, *e*, is plunged. If the neck *e* be made large, and the water from the bason *g* should, by a rapid condensation in *c*, be forced up the neck, the surface of the water in *g* will fall so much as to leave the lower orifice of *e* uncovered, before any considerable rise can take place; but if *f* were narrower, its whole capacity would be filled, and the water would run over into *c*, before the fall in *g* would be sufficient to uncover the orifice of *f*, and restore the equilibrium, by admitting common air.

CHEMISTRY, (χιμια, and sometimes χημια; or *chamiah*, from *chamah*, Arab. to burn; this science being the examination of all substances by fire). The learned world are not yet agreed as to the most proper definition of chemistry. Boerhaave seems scarcely to have ranked it among the sciences. Macquer calls it "*a science, whose object is to discover the nature and properties of all bodies by their analysis and combinations.*" Dr. Black says, it is "*a science which teaches, by experiments, the effects of heat and mixture on bodies.*" Fourcroy defines it "*a science which teaches the mutual actions of all natural bodies on each other.* "*Chemistry*," says Jacquin, "*is that branch of natural philosophy which unfolds the nature of all material bodies, determines the number and properties of their component parts, and teaches us how those parts are united, and by what means they may be separated and recombined.*" Mr. Heron, a later writer, defines it, "*that science which investigates and explains the laws of that attraction which takes place between the minute component particles of natural bodies.*"

The object of chemistry is to ascertain the nature and properties of bodies, or to explain the intimate action of all natural substances upon each other. The methods, by which this knowledge is principally acquired, are analysis and synthesis; the former signifying the separation or decomposition of the constituent parts of a compound substance, the latter the formation or composition of a compound body by the artificial reunion of its constituent principles.

That a thorough knowledge of chemistry forms an indispensible part of a physician's education no one can doubt; and "pharmacy," as Dr. A. Duncan observes, "is so intimately connected with chemistry, that the former can neither be understood as a science, nor practised with advantage as an art, without a constant reference to the principles of the latter."

The origin of chemistry is by no means evident; it is involved in equal obscurity with that of other arts and sciences. The ancient nations seem however to have possessed considerable knowledge of this kind. The art of working metals, which dates from the most remote antiquity; the lustre which the Phœnicians gave to certain colours; the luxury of Tyre; the numerous manufactures which that opulent city included within its walls—all announce a degree of perfection in the arts, and suppose a considerable extent and variety of chemical knowledge. But the principles of this science were not then united into a body of doctrine; they were concentrated in the workshops of the manufacturers, where they had their origin; and observations alone, transmitted from one operator to another, enlightened and conducted the steps of the artist. Such, no doubt, has been the origin of all the sciences. At first they presented unconnected facts; truths were confounded with error; time and genius could alone clear up the confusion; the progress of information is however always the fruit of slow and painful experiment. It would be difficult, therefore, to point out the precise epocha of the origin of chemical science; but we find traces of its existence in the most remote ages. Agriculture, mineralogy, and all the arts which are indebted to it for their principles, were cultivated and enlightened. We behold the original nations, immediately succeeding the fabulous ages, surrounded by all the arts which supplied their wants. Chemistry may therefore be compared to that famous river whose waters fertilize the lands they inundate, but the sources of which are still unknown. The ancient Egyptians appear, however, to have the strongest claim to the invention of this science. Thoth or Athotis, who became king of Thebes, and was surnamed Hermes or Mercury, is considered as the first of this nation who cultivated the science of chemistry. After him we find Siphoas, an Egyptian monarch, distinguished as a philosopher and chemist. The period in which he lived has been supposed to be about 1900 before the Christian æra. He has been named Hermes or Mercury Trismegistus by the Greek writers, who have also considered him as the inventor of natural philosophy. But though, in fact, we know little respecting the Egyptian chemists, the science appears to have made considerable progress among them, since they practised many of those arts which depend on chemistry, such as the art of forming imitations of the precious stones, of casting and working metals, of painting upon glass, &c. But Egypt, which seems to have been the nurse of chemistry reduced to principles, was not however slow in turning the applications of this science towards a chimerical end. The first seeds of chemical science were therefore soon cherished by the passion for making gold. In an instant all the labours of

operators were directed towards alchemy alone; and the industry of several centuries was consecrated to the enquiry after the philosopher's stone. The principal operators in this way, however, were Geber and Rhazes, among the Arabians; Roger Bacon and Sir George Ripley, in England; Arnold of Villeneuve, in France; Raymond Lully in Majorca; and Basle Valentine, in Germany. It must be allowed that the alchemists have retarded the progress of chemistry; yet on many accounts they are unquestionably entitled to esteem. In their writings, the profoundest views of genius are every where to be observed, but allied with the most extravagant ideas. The most sublime truths are degraded by applications of the most ridiculous nature; and the astonishing contrast of superstition and philosophy, of light and darkness, compels the reader to admire them, even at the instant that he cannot withhold his censure.

Chemistry is indeed indebted to alchemy for some truths, and for several professors of the art: but the obligation is small, in comparison to the mass of useful knowledge that might have been afforded during the course of several centuries; if, instead of endeavouring to form the metals, the operations of chemists had been confined to analysing them, simplifying the means of extracting them, combining them together, working them, and multiplying and rectifying their uses and modes of application.

The passion for making gold was succeeded by the seductive hope of prolonging life by means of chemical knowledge. The persuasion was readily admitted, that a science which afforded remedies for many diseases, might easily succeed in producing an universal medicine. Thus, the alchemists, after having exhausted themselves in the search after the philosopher's stone, seem to have redoubled their efforts to arrive at an object still more chimerical and visionary. At this period the elixirs of life, the arcana, and the polychrest medicines, had their origin.

The chimerical notion of an universal medicine agitated the minds of men in the sixteenth century; and at that time immortality was promised with the same effrontery that a quack now announces his remedy for every disease. The people are easily seduced by flattering promises; but the man of observation can never be led to think that chemistry can succeed in reversing that general law of nature which condemns all living beings to renovation, and a continual circulation of decompositions and successive generations. This sect, therefore, gradually became an object of contempt; and its disgrace was finally completed by the enthusiast Paracelsus, who, after having flattered himself with immortality, died at the age of forty-eight, in an inn at Saltsburg.

Hitherto, however, chemistry had not been cultivated in a philosophical manner. Many of the arts which depend on it had indeed been described, medical formulæ had been invented, and the nature of metals examined, but principally with a view to the making of gold, or the discovery of an universal medicine. Nothing further had even been attempted. A variety of chemical facts were known, but no endeavours had been made to methodize or form them into a general system. The execution of this difficult and important task was reserved for the superior genius and industry of those who appeared on the ruins of the two sects we have already mentioned. Among whom Barnet, Bohnius, Kunckel, Boyle, Glaser, and Glauber, deserve to be particularly noticed. They examined the crude and indigested aggregate, and separated from the confused mass of phenomena, of truth and error, those parts which tended to enlighten and improve the science. But it is to the celebrated, though unfortunate Becher, who appeared nearly about this time, that chemistry is particularly indebted. He withdrew it from the too narrow limits of pharmacy; he showed its connection with all the phenomena of nature; and the theory of the formation of metals, the phenomena of fermentation, the laws of putrefaction, were all comprehended and developed by his superior genius. Chemistry was now directed to its true object: and J. Ernest Stahl, who was born with a natural fondness for chemistry, and with a genins not inferior to any of those who had preceded him, succeeded Becher, and reduced to certain general principles all the facts with which his predecessor had enriched the science. He spoke a language less enigmatical; he classed all the facts with order and method; and purged the science of that alchemic infection, to which Becher himself was too much attached. The name of this philosopher therefore marks the commencement of a new æra in the annals of chemical science. There will be however some cause for surprise at the slow progress of chemical science, when the greatness of the claims of Stahl are compared with the few additions that have been made to his doctrine, until the middle of the last century. Some reason for this will, however, be met with on consulting the labours of the chemists who have succeeded him; as we shall find most of them chained down to his steps, and blindly subscribing to his opinions. Whenever a well-made experiment cast a gleam of light unfavourable to his doctrine, they seem to have given themselves much trouble in forming an interpretation of it conformable to his ideas. Thus, the increase of weight which metals acquire by calcination, though a fact little favourable to the idea of the subtraction of a principle without any other addition, was incapable of injuring this doctrine.

The strong desire of reducing every thing to first principles, and of establishing a theory upon

incomplete experiments, and facts imperfectly understood, has also been highly prejudicial to the progress of this science.

It must therefore be allowed, that although the labours of Stahl, Boerhaave, Macquer, Dr. Black, Mr. Cavendish, Dr. Priestley, and some others, had contributed in a high degree to improve and advance the science of chemistry, still much remained to be accomplished, and particularly with respect to the nature of gaseous substances.

Stahl, from being wholly engaged in demonstrating the existence of phlogiston, and in tracing it through its various combinations with other bodies, seems to have totally neglected or overlooked the influence of air in most of those phenomena which he particularly ascribed to the energy of the inflammable principle. The necessity of referring many chemical phenomena to the operation of that fluid, had however been already pointed out by Boyle and Hales; and Dr. Priestley, by repeating the experiments of the latter, had discovered a number of fluids, which though they had the appearance of air, differed from it in many respects. From the calces of metals he had even extracted a species of air much purer than atmospheric air. The ingenious and accurate Mr. Bayen had also examined the calces of mercury, and found that they were reducible without phlogiston, and that during the calcination they emitted a considerable quantity of an aëriform fluid.

But it is to the superior ingenuity and acuteness of Mr. Lavoisier that we are indebted for the discovery, that during the process of calcination a portion of air constantly enters into combination with the body which is calcined. The discovery of this important fact led him to doubt the existence of phlogiston, and to ascribe all the phenomena which Stahl had referred to the separation or combination of what he called phlogiston, to the fixation or disengagement of air. The great number and variety of facts which successive discoveries have brought in support of this doctrine, would seem to point out its superior claims, and prove it to be not only more fully demonstrated than that of Stahl, but also to agree better with that accuracy and method which prevails in natural philosophy.

It is necessary to observe farther, that, as discoveries have become infinitely multiplied in chemistry, the necessity of remedying the confusion which has so long prevailed, has been seen, and has indicated the necessity of a reform in the language of the science. The relation is so intimate between words and facts, that the alteration which takes place in the principles of a science ought to be attended with a similar alteration in its language. It is no more possible to preserve a vicious nomenclature with a science which becomes enlightened, extended, and simplified, than to polish, civilize, and instruct uninformed man without making any change in his natural language. Those chemists who have written on any subject have been struck with the inaccuracy of the words in common use, and have considered themselves at liberty to introduce any change; consequently chemical language has become insensibly longer, more confused, and more unpleasant. Thus the carbonic acid has been known, for several years, under the names of fixed air, aërial acid, mephitic acid, cretaceous acid, &c. and our posterity may probably hereafter dispute whether these various denominations were not applied to different substances. It was therefore become necessary to reform the language of chemistry. The imperfections of the ancient nomenclature, and the discovery of many new substances rendered this change indispensibly necessary; and it was particularly necessary to defend this change from the caprice and fancy of individuals, and to establish the new language upon invariable principles. The only means of insuring this purpose was that of erecting a tribunal in which chemists of acknowledged merit might discuss the words received, without prejudice and without interest; in which the principles of a new nomenclature might be established and purified by the severest logic; and in which the language should be so well identified with the science, and the word so well applied to the fact, that the knowledge of the one should lead to the knowledge of the other. This very important and necessary undertaking was accomplished by the French chemists, Messrs. De Morveau, Lavoisier, Berthollet, and De Fourcroy, in 1788.

In conformity to the definition which has been given of the Science of Chemistry, the theory of it should consist in a complete knowledge of the phenomena resulting from the various combinations and decomposition to which its different objects are exposed. From the great variety and diversity of these objects, and the multiplicity of facts which their different combinations and decompositions supply, and which constitute the present system of chemical science; it would, however, be impossible to convey an adequate knowledge of the whole. The only thing that can therefore be done, and what is abundantly sufficient for the medical chemist, is to furnish an account of the principal and most interesting phenomena which present themselves on the mixture of particular substances, or of the appearances which these exhibit on exposure to the more powerful chemical agents. This we have endeavoured to accomplish under the different heads to which the subjects belong, and to which the reader is referred.

The objects of chemistry are so extremely numerous, that they may be said to comprehend all the substances that compose the globe which we inhabit, whether buried in its interior parts, or

found on its surface. They are not, however, all capable of being examined with equal facility. Fire, one of the most active bodies in nature, is so incapable of being subjected to experiment, that its nature is still far from being perfectly understood. Its importance as a chemical agent would, therefore, seem to demand further investigation.

As the whole of the practical part of this science consists in placing bodies in contact with each other, in such a manner as that they may exert their respective attractions or powers of combination without intermixture or disturbance of other bodies not designed to enter the proposed experiments, and in raising or lowering the temperature of such bodies under examination, it is obvious that the degree of success attending researches of this kind must depend in a great measure upon the instruments or apparatus made use of; and also that a great number of the terms used in chemistry will be either descriptive of these instruments or of the operations performed with them.

Among the instruments employed in chemistry, there are some which are of general use, and applicable to most operations; and others which serve only for peculiar purposes. In this article we can only treat of the former: the others must be described under such heads as render it necessary to consider their uses. The chemical instruments most frequently employed are furnaces. These consist of earthen vessels appropriated to the various operations performed upon bodies by means of fire. A proper mixture of sand and clay is commonly the material of which these vessels are formed. But it is difficult, and even impossible, to prescribe and determine, according to any invariable method, the proportions of these constituent parts; because they must be varied according to the nature of the earths made use of. The different methods of applying fire to substances under examination, have occasioned the construction of furnaces in different forms: all of which may be here reduced to the following kinds. See the articles Chemical Apparatus, Furnace, Evaporatory, Reverberatory, &c.

In several operations retorts are employed (see Retort). These it is often necessary to defend from the immediate action of the fire, and also to coerce and restrain the expansible vapours, which are very elastic, and frequently corrosive. To answer these purposes various lutes have been employed. It is certain that a glass retort exposed to the action of the fire would break, if the operator was not to have recourse to the prudent precaution of coating it with earth. For this purpose M. Chaptal found it advantageous to use a mixture of fat earth and fresh horse-dung. The fat earth is moistened for some hours in water; and when it is properly softened, it is kneaded with the horse-dung, and formed into a soft paste, which is applied and spread with the hand upon every part of the retort intended to be exposed to the action of the fire. The horse-dung combines several advantages. It contains a serous fluid, which hardens by heat, and strongly connects all the parts together; but when this juice has been altered by fermentation or age, the dung does not possess the same virtue; and the filaments or stalks of hay, which are so easily distinguished in horse-dung, unite all the parts of the lute together. Retorts luted in this manner resist the impression of the fire very well; and the adhesion of the lute to the retort is such, that even should the retort fly during the operation, the distillation may be still carried on.

But when it is required to coerce or oppose the escape of the vapours which are disengaged during any operation, it is sufficient if the joinings of the vessels be covered with paper glued on, or with slips of bladder moistened with the lute of lime and white of egg, provided the vapours be neither dangerous nor corrosive; but, when the vapours are corrosive, it is necessary to use the fat lute to retain them. This lute is made with boiled linseed oil, mixed and well incorporated with sifted clay. Nut oil, kneaded with the same clay, forms a lute possessing the same properties. It is easily extended in the hand, and is used for defending the joinings of vessels, upon which it is afterwards secured by strips of linen, dipped in the lute of lime and white of egg. But previous to the application of heat in any distillation, it is necessary to suffer the lutes to dry. Without this precaution, the vapours would rise and escape; or otherwise they would combine with the water which moistens the lutes, and would corrode and destroy the bladder, the skin, the paper, and in short every substance used to secure them in their places. The lute of lime and white of egg dries very speedily, and must be used the moment it is made. This lute likewise opposes the greatest resistance to the escape of the vapours, and adheres the most intimately to the glass. It is prepared by mixing a small quantity of finely-powdered quick-lime with white of egg, and afterwards beating up the mixture to facilitate the combination. It is then to be instantly applied on pieces of old linen, wrapped round the places of joining. But in large works, where it is not possible to attend to all these minute details, the joinings of the retort and receiver are luted together with the same lute which is used to coat the retorts. A covering of the thickness of a few lines is sufficient to prevent the vapours of the marine or nitrous acid from escaping.

But in certain operations a disengagement takes place of such a prodigious quantity of vapours that it is dangerous to confine them; yet the suffering them to escape would occasion a considerable loss in the product; therefore an appara-

tus has been contrived of great ingenuity and simplicity to moderate the issue, and to retain without risk such vapours as would otherwise escape. This apparatus is known by the name of its author, Mr. Woulfe; and his excellent process consists in adapting the extremity of a recurved tube to the tubulure of the receiver; the other end of which is plunged into water, in a bottle half filled, and properly placed for that purpose. From the empty part of this bottle issues a second tube, which is in like manner plunged in the water of a second bottle. A number of other bottles may be added, observing the same precautions; with the attention, nevertheless, to leave the last open, to give a free escape to the vapours which are not coercible: and, when the apparatus is thus disposed, all the joinings are to be luted. It will easily be imagined that the vapours which escape from the retort are obliged to pass through the tube adapted to the tubulure of the receiver, and consequently must pass through the water of the first bottle: they therefore suffer a first resistance, which partly condenses them. But as almost all vapours are more or less miscible and soluble in water, a calculation is previously made of the quantity of water necessary to absorb the vapours which are disengaged from the mixture in the retort; and care is taken to distribute this proper quantity of water in the bottles of the apparatus. By this means the purest and most concentrated products may be obtained; as the water, which is always the receiver and the vehicle of these substances, becomes saturated with them. There is probably no other method of obtaining products always of an equal energy, and comparable in their effects; a circumstance of the greatest importance in the operations of the arts, as well as in philosophical experiments. This apparatus has been applied to works in the large way. It has been used to extract the common muriatic acid, the oxygenated muriatic acid, ammoniac or volatile alkali, &c. As in this apparatus it would very often happen that the pressure of the external air would cause the water of the outer vessels to pass into the receiver, in consequence of the simple refrigeration of the retort; this inconvenience has been obviated, by inserting a straight tube into the necks of the first and second bottles, to such a depth, that its lower end is plunged into the water, while its other end rises several inches above the neck of the bottle. It may easily be conceived, as a consequence of this disposition, that, when the dilated vapours of the receiver and retort are condensed by cooling, the external air will rush through these tubes to establish the equilibrium; and the water cannot pass from the one to the other. Before the invention of this apparatus, it was usual to drill a hole in the receiver, which was kept closed, and only opened from time to time for the escape of the vapours. But this method was inconvenient in many respects. In the first place, in spite of all precautions, it was attended with the risk of an explosion every moment, by the irregular disengagement of the vapours, and the impossibility of calculating the quantity produced in a given time. A second inconvenience was, that the vapours which thus escaped occasioned a considerable loss in the product, and even weakened the remainder; because this volatile principle consisted of the strongest part. A third inconvenience was, that the vapours which escaped incommoded the artist to a very great degree.

It is therefore evident, that the invention of Woulfe, with the improvements suggested under the article CHEMICAL APPARATUS, unite a number of advantages; such, for instance, as economy in the processes, superiority in the product, and safety to the operator; and the original inventor is unquestionably entitled to the best acknowledgments of the cultivators of chemical science.

CHEMO'SIS, (χημωσις, from χαινω, *to gape*); an inflammation of the tunica conjunctiva, in which the white of the eye seems to swell above the cornea, so that the pupil seems to be thrown back into a hollow place. In Cullen's Nosologia, it is a variety of the *ophthalmia membranarum*, or an inflammation of the membranes of the eye. Gently astringent and sedative lotions usually effect the cure.

CHENOPO'DIUM, (χηνοποδιον; from χη, *a goose*, and πȣς, *a foot;* so called from its supposed resemblance to a goose's foot); the herb CHENOPODY, goose's foot, or pes anserinus.

CHENOPO'DIUM AMBROSIOI'DES; the systematic name of the Mexican tea plant. See BOTRYS MEXICANA.

CHENOPO'DIUM ANTHELMI'NTICUM: *chenopodium anthelminticum*; *foliis ovato-oblongis dentatis, racemis aphyllis*, Linn. The seeds of this plant, though in great esteem in America for the cure of worms, are never exhibited in this country. They are powdered, and made into an electuary with any proper syrup or conserve.

CHENOPO'DIUM BONUS HENRI'CUS; the systematic name of the English mercury. See BONUS HENRICUS.

CHENOPO'DIUM BOTRYS; the systematic name of the Jerusalem oak. See BOTRYS VULGARIS.

CHENOPO'DIUM VULVA'RIA; the systematic name of the stinking orache. See ATRIPLEX OLIDA.

CHE'RAS; a name for the struma or scrophula.

CHERIMO'LIA; a species of ANNONA.

CHE'RLERI; Spanish purple rest-harrow, a species of ONONIS. Also the name of a species of trefoil.

CHE'RLERIA; a genus in Linnæus's botany. There is but one species.

CHERMES; berries produced by the *quercus coccifera* of Linnæus. *Kermes*, among the Arabians, signifies a small worm; and κοκκον, amongst the Greeks, whence the Latin word *coccum*, both which mean a kernel or grain; for which reason, among the later Greeks, instead of the word κοκκον, the word σκωληξ, *a worm*, is substituted; for these grains (or small berries) are full of little worms, the juice of which affords the scarlet colour and dye. Hence, the worm is taken for the grain itself. The insect, resembling the greenhouse bug, lays its eggs on the scarlet oak: the males have wings, but not the females. The juice was formerly made into a confection, called *confectio alkermes*, which has been long disused.

CHERRY. See CERASA NIGRA and CERASA RUBRA.

CHERRY-BAY. See LAURO-CERASUS.

CHERRY-LAUREL. See LAURO-CERASUS.

CHERRY, WINTER. See ALKEKENGI.

CHERVIL. See CEREFOLIUM.

CHESELDEN (William); an eminent anatomist and surgeon, was born at Burrow on the Hill, in the county of Leicester, descended from an ancient family in the county of Rutland, whose arms and pedigree are in Wright's "History of Rutland." He received the rudiments of his professional skill at Leicester; and married Deborah Knight, a citizen's daughter, by whom he had one daughter. In 1713, he published his Anatomy of the Human Body, in one volume 8vo.; and, in 1723, A Treatise on the High Operation for the Stone. He was one of the earliest of his profession who contributed by his writings to raise it to its present eminence. In the beginning of 1736, he was honourably mentioned by Mr. Pope, as "the most noted and most deserving man in the whole profession of chirurgery." He appears indeed to have been on terms of the most intimate friendship with Mr. Pope, who frequently, in his Letters to Mr. Richardson, talks of dining with Mr. Cheselden, who then lived in or near Queen-square. In February 1737, Mr. Cheselden was appointed surgeon to Chelsea Hospital. He died at Bath, April 11, 1752, of a disorder arising from drinking ale after eating hot buns. Finding himself uneasy, he sent for a physician, who advised vomiting immediately; and, if the advice had been taken, it was thought his life might have been saved. By his direction, he was buried at Chelsea.

CHESNUT, HORSE. See HIPPOCASTANUM.

CHEST; a familiar name for the thorax. See THORAX.

CHEVA'STRE; a double-headed roller, applied by its middle below the chin; then running on each side, it is crossed on the top of the head; then passing to the nape of the neck, is there crossed; then passes under the chin, where crossing, it is carried to the top of the head, &c. until it is all taken up.

CHIAN PEPPER. See CAPSICUM.

CHIAN TURPENTINE. See CHIO-TURPENTINE.

CHIA'STOS, (χιαστος); the name of a bandage described by Oribasius, and so called from its resembling the Greek letter χ.

CHIA'STRE; the name of a bandage for the temporal artery. It is a double-headed roller, the middle of which is applied to the side of the head, opposite to that in which the artery is opened, and, when brought round to the part affected, it is crossed upon the compress that is laid upon the wound, and then, the continuation is over the coronal suture, and under the chin; then crossing on the compress, the course is, as at first, round the head, &c. till the whole roller is taken up.

CHIBOU; a spurious species of gum elemi, spoken of by the faculty of Paris, but not known in England.

CHICKEN, or CHICK; the young of the gallinaceous order of birds, especially the common hen. See FOWL.

CHICK-WEED. See ALSINE MEDIA.

CHILBLAIN, or *pernio;* the *erythema* of Dr. Cullen. This well-known disease is produced by excessive cold applied to the extremities, and especially if the part affected with cold has been too suddenly afterwards exposed to heat. Chilblains are most common in the heels, but they sometimes appear on the fingers, toes, arms, hands, or feet, or even on the tips of the nose and ears. They are inflammatory tumors, attended with heat, redness, shooting pains, and great itching, and in some habits the limbs also swell considerably, and the skin bursts in several parts of them, discharging a thin fœtid matter. These symptoms particularly take place in the heels, the integuments of which are apt to mortify and slough off, leaving always very ill conditioned ulcers behind. Before these make their appearance, the parts generally assume a livid colour, and are covered with large vesicles similar to those produced in a scalded part.

These troublesome swellings being occasioned by the application of too great a degree of cold to parts of the body where the circulation is most languid, the symptoms must of course differ very materially, according to the nature of the part affected, as well as the strength of the patient, and the degree of cold applied. Children, or those below puberty, are most subject to chilblains, as well from the laxity of their fibres, as from their being more frequently exposed to those causes which produce them; and those who have once been subject to such complaints are always liable, unless the greatest care be taken, by keeping the parts dry and warm, to have them again. At times, however,

when the extremities have been exposed to long and severe cold, it will be impossible, by any care or attention, to prevent the disease. As soon, therefore, as any sign of it is perceived, if any snow is to be had, the parts ought to be well rubbed within a room without a fire; or, if snow cannot be got, we must take ice, or the coldest water we can find, into which the parts are to be plunged for a few minutes, and then gently, but perfectly, dried, after being taken out of the water. These remedies will sometimes prevent the disease from going to any length; but should it happen otherwise, or the chilblains have appeared before the surgeon is called, we may apply, on linen rags, the following solution of muriated ammonia:

℞. Ammoniæ muriatæ unc. ss.
Aceti distillat. unc. vi.
Fiat solutio.

Or the following, which is still more efficacious:

℞. Aluminis drach. ij.
Aceti unc. vi.
Sp. vini rect. unc. ij.
Fiat solutio.

Electricity, rubbing the parts with oil of turpentine, or camphorated oil, or volatile liniment, may be also of use. But it must be remarked, that, unless the patient can be persuaded to keep the parts affected dry and warm during frosty weather, almost no application that can be used will be of any service. As this complaint, when violent, seems always to arise from some defect of circulation, or laxity of fibres, general tonics promise to be of service as a preventive. The sea or shower-bath are very efficacious in this way; and, if these be begun about the middle of September, and persevered in for several weeks, there will be much less danger of chilblains during the ensuing season than if no such thing had been used. But, in case of ulcerations, which are common in young people who generally neglect the disease, we must avoid either relaxing ointments, or emollient poultices, for both these have a tendency to promote the growth of fungous flesh, with which these ulcers are constantly over-run. Instead of this, the whole surface of the ulcer must be destroyed by lunar caustic; and, after the eschar has sloughed off, we must dress the sore in the most simple manner. If the caustic has reached so deep as to destroy the whole of the diseased skin down to the cellular substance, there will be no danger of the parts filling up with unsound flesh.

In Scotland, chilblains are exceedingly common among the country people, whose heels they generally affect. They produce fungous ulcerations; and it is a very common remedy to destroy the fungous flesh at once by a hot iron; which not only effectually removes the complaint for that time, but it never afterwards returns in that place. In the northern parts, they apply alum beaten up with the white of an egg, and put on a pledget of tow; and this with no small benefit to the patient.

CHILD; a term of relation to a human parent. The physical education of children is a matter of the utmost importance to themselves and to society. For some remarks on this, and on their diseases at the earliest periods, see INFANT, NURSING, &c.

Bartholine, Paré, Licetus, and other writers, give an account of a petrified child, which has seemed wholly incredible to some people. The child, however, which they describe, is still preserved, and is kept as a great rarity in the king of Denmark's museum at Copenhagen. The woman who was big with it, lived at Sens, in Champaigne, in the year 1582. It was cut out of her belly, and was universally supposed to have lain there about twenty years. That it is a real human fœtus, and not artificial, is evident to the eyes of any observer; and the upper part of it, when examined, is found to be of a substance resembling gypsum, or stone whereof they make plaster of Paris. The lower part is much harder, the thighs and buttocks being perfect stone of a reddish colour, and as hard as common quarry stone: the grain and surface of this part appear exactly like that of the calculi or stones taken out of human bladders: and the whole substance examined ever so nearly, and felt ever so carefully, appears to be absolute stone. It was carried from Sens to Paris, and there purchased by a goldsmith of Venice; and Frederic III. king of Denmark, purchased it of this man, at Venice, for a very large sum, and added it to his collection.

A fœtus, taken also from the abdomen of a woman, after its retention there twenty years, is now in the possession of Dr. heston, of Gloucester. It forms, with its membranes, a ball of ossific matter; a section of which exhibits the fœtus in a very complete state.

CHILD-BED; the state of a lying-in woman.

CHILD-BIRTH; human parturition. See LABOUR.

CHILIADY'NAMIS, (χιλιοδυναμις, from χιλιας, *a thousand*, and δυναμις, *virtue*); an epithet of the herb POLEMONIUM. In Dioscorides, this name is given on account of its many virtues.

CHI'LON, (χειλων, from χειλος, *a lip*); an inflamed and swelled lip.

CHILPELAGUA. See CAPSICUM, of which it is a variety.

CHI'LTERPIN. See CAPSICUM, of which this plant is a species.

CHINA-ROOT, in the materia medica, the root of a species of smilax, brought both from the East and West Indies; and thence distinguished into oriental and occidental. Both sorts are longish,

full of joints, and of a pale-red colour, with no smell, and very little taste. The oriental, which is the most esteemed, is considerably harder, and paler-coloured than the other. Such should be chosen as is fresh, close, heavy, and, upon being chewed, appears full of a fat unctuous juice. It is generally supposed to promote insensible perspiration and the urinary discharge, and by its unctuous quality to correct the animal juices. China-root was first brought into Europe in the year 1535, and used as a specific against venereal and cutaneous disorders. With this view, it was made use of for some time; but has long given place to more powerful medicines.

CHINCHI'NA ANGUSTIFO'LIA; a kind of bark obtained from the *cinchona angustifolia; foliis lanceolatis, pubescentibus, floribus paniculatis*, of Swartz. Its virtues are similar to those of the common Peruvian bark, described under CINCHONA. If any thing, it is said to be more astringent, and to have an aromatic property.

CHINCHI'NA CARIBÆ'A, or *chinchina Jamaicensis.* The bark ordered by this title in foreign pharmacopœias, is procured from the *chinchona caribæa; pedunculis unifloris*, Linn. It was administered with great success in Jamaica, by Dr. Wright, in remittent fevers, and some other disorders. See CINCHONA.

CHINCHI'NA DE SANTA FE'. There are several species of bark sent from Santa fè: but neither their particular natures, nor the trees which afford them, are yet accurately determined. Nothing but fair and repeated trials of their virtues, can entitle them to a place in the pharmacopœias.

CHINCHI'NA JAMAICE'NSIS. See CHINCHINA CARIBÆA.

CHINCHI'NA RUBRA. See CINCHONA CORTEX PERUVIANUS RUBER.

CHINCHI'NA ST. LUCIÆ; the St. Lucia bark, collected from the *anchona floribunda; floribus paniculatis glabris, capsulis turbinatis lævibus, foliis elipticis acuminatis glabris*, of Swartz. It has an astringent, bitter taste, somewhat like gentian root. It is recommended in intermittents, putrid dysentery, and dyspepsia; but it should always be joined with some aromatic.

CHINCOUGH, otherwise called HOOPING-COUGH; a convulsive kind of cough which is contagious, and to which children are very generally subject. See HOOPING-COUGH.

CHINESE ASTER; a species of ASTER.

CHIO TURPENTINE, *terebinthina de chio;* cyprus, or chian turpentine. This substance, which is classed among the resins, is procured by wounding the bark of the trunk of the *pistachia terebinthus*, Linn. The best chio turpentine is about the consistence of honey, very tenacious, clear, and almost transparent; of a white colour, inclining to yellow, and a fragrant smell, moderately warm to the taste, but free from acrimony and bitterness. Its medicinal qualities are similar to those of the turpentines. See TURPENTINES.

CHIOCO'CCA; a genus in Linnæus's botany. He enumerates two species.

CHIONA'NTHUS; the fringe-tree, or snow-drop-tree, a genus in Linnæus's botany. There are two species.

CHI'QUES; a name for the worms which get into the toes of the negroes, and which are destroyed by the oil which flows out of the cashew nutshell.

CHI'RAGRA, (χειραγρα; from χειρ, *the hand*, and αγρα, *a seizure); gout in the joints of the hand. See ARTHRITIS.

CHI'RON, a famous person of antiquity; styled by Plutarch "*The wise Centaur.*" Sir Isaac Newton places his birth in the first age after Deucalion's deluge, commonly called the *Golden Age.* He is generally called the son of Saturn and Phyllyra; and is said to have been born in Thessaly among the Centaurs, who were the first Greeks that had acquired the art of breaking and riding horses: whence the poets, painters, and sculptors, have represented them as a compound of man and horse; and perhaps it was at first imagined by the Greeks, as well as by the Americans, when they first saw cavalry, that the horse and the rider constituted the same animal. Chiron is represented by the ancients as one of the first inventors of medicine, botany, and *chirurgery*, a word which some etymologists have derived from his name.

CHIRO'NIA; AFRICAN CENTAURY, or *urnwort*, a genus in Linnæus's botany. He enumerates ten species.

CHIRO'NIUM, (χειρωνιον), a species of LASERPITIUM. Also an epithet of a malignant ulcer, difficult to be cured, with a hard, callous, and tumid margin; so called from Chiron the Centaur, who is said to have been the first who knew how to cure them.

CHIROTHE'CA, and PODOTHECA, (from χειρ, *manus*, and πες, *pes*, and τιθημι, *pono*, to put); in the preparation of anatomical subjects, a glove and a shoe of the scarf-skin, with the nails adhering to them. They are brought off with very little trouble after the cuticle loosens from the parts below by putrefaction, which comes on by long keeping in water; and this method is better than that of forcing off this skin by means of boiling water, as formerly practised.

CHIRU'RGIA, (χειρεργια, from χειρ, *a hand*, and εργον, *a work); manual operation, or surgery; or that part of medicine which consists of manual operation. See SURGERY.

CHI TCHOUANG; a Chinese name for the syphilis.

CHITTICKS LITHONTRIPTIC; a nostrum which, some years ago, had great reputation

as a solvent for the urinary calculus. It was no other than the capital soap lye; and the following are the directions for using it: Take one tea-spoonful of the strongest soap-lye, mixed in two table-spoonfuls of milk, an hour before breakfast and at going to bed. Before you take the medicine, take a draught of pure milk, and, immediately after you have swallowed the medicine, take another. If you find this agrees for two or three days, you may add half as much more to the dose. Dr. Cullen, however, alleges that this remedy has failed in many instances. See ANTACIDA.

CHI-TUA; a species of AGALLOCHUM.

CHIVES, in botany, slender thread-like substances, generally placed within the blossom, and surrounding the pointals. They are, more technically, named stamina (see STAMINA). They are formed of the woody substance of the plant.

CHLO'RA; a genus in Linnæus's botany. He enumerates four species.

CHLORO'SIS, (χλορωσις; from χλωρος, *green*, *pale*; from the yellow greenish complexion of those who are affected with it); the GREEN SICKNESS. It is a genus of disease in the class *neuroses*, and order *adynasmiæ* of Cullen.

Of this genus, Dr. Cullen thinks there is but one idiopathic species, viz. what some distinguish by the title of *chlorosis virginea*, others of *chlorosis amatoria*.

The chlorosis usually attacks girls a little after the time of puberty, and first shows itself by symptoms of dyspepsia. But a distinguishing symptom is, that the appetite is entirely vitiated, and the patient will eat lime, chalk, ashes, salt, &c. very greedily; while at the same time there is not only a total inappetence to proper food, but it will even excite nausea and vomiting. In the beginning of the disease, the urine is pale, and afterwards turbid; the face becomes pale, and then assumes a greenish colour; sometimes it becomes livid or yellow: the eyes are sunk, and have a livid circle round them; the lips lose their fine red colour; the pulse is quick, weak, and low, though the heat is little short of a fever, but the veins are scarcely filled; the feet are frequently cold, swell at night, and the whole body seems covered with a soft swelling; the breathing is difficult: nor is the mind free from affection as well as the body; it becomes irritated by the slightest causes; sometimes the patients love solitude, and become sad and thoughtful. There is a retention of the menses throughout the whole course of the disorder; and at last all the bad symptoms increasing, a leucophlegmasia, anasarca, atrophy, and death, succeed.

The cause of chlorosis is thought to be an atony of the muscular fibres of the alimentary canal, especially of the stomach, joined with a similar atony of the perspiratory vessels over the whole surface of the body; and the whole depending on an atony of those small arteries which pour out the menstrual blood. This atony may be occasioned by the same causes which bring on dyspepsia and hypochondriasis, but very frequently arises from love and other passions of the mind.

This disease, in all cases, is tedious, though it does not generally prove fatal; but we can never promise a certain cure unless the menses make their appearance. The remedies here in general are the same as in the dyspepsia and hypochondriasis (see those articles); only, in the chlorosis, stronger purgatives may be made use of. Those which stimulate the rectum, especially aloetics, are useful by stimulating also the vessels of the uterus; and for this reason indulgence in venery has sometimes been said to produce a cure, particularly with love-sick maids. The cold bath is also extremely proper, particularly sea-bathing.

Dr. Smith observes, that these obstructions may sometimes be owing to a plethora, and then they are to be removed by bleeding and antiphlogistic remedies. But we find, that they much more frequently depend upon a cachectic habit, relaxed solids, and a weakened circulation; and, in this case, the intentions of cure will consist in a directly opposite treatment, namely, in strengthening the solids, and promoting the circulation. In short, restore the body to a healthy state, and this, as a natural excretion, will succeed.

Cupreous emetics and gentle stomach purges, with medicines of the chalybeate and strengthening kinds, the doctor says, will most avail. The following will often succeed extremely well:

℞ Pill. alo. cum myrrh.
Pill. fœtid. comp.
Ferri vitriolat. sing. ʒj.
Ol. succin. rectificat. gtt. xx.
Syr. croci, q. s. ut. ft. pill. No. xii. e ʒj.
Sumend. ij. vel iij. mane et vesper.

Or,

℞ Tinct. ferri muriati ʒij.
Tinct. aloes cum myrrh. ℥j.
M. capiat. coch. minim. (a tea-spoonful) ter quaterve de die ex quovis vehiculo.

Or,

℞ Ferr. vitriolat.
Kali præp.
Myrrhæ, sing. ℈j.
Aquæ pulegii ℥vj. M. fiat mistura.
Capiat coch. j. quartis horis.

The suppression, which is owing to a contraction of the uterine vessels, is to be relieved by relaxing the parts, and determining with more force the fluids, to dilate the extremities of the vessels. The steams of warm water, the warm bath, and the

like, may abate the contraction, and the warm emmenagogues may tend to force down the menses.

℞ Pulv e. myrrh. comp. ℈j.}
Ferr. ammoniac. gr. vj.
Extract. sabinæ gr. iiij.
Syr. croci q. s. ut. ft. boi. ter die sumend.

Calomel has sometimes been of use, to remove obstructions; and in many cases may be prescribed to advantage, especially in vigorous and strong habits.

CHOA'NUS, (χοανος); a funnel, or furnace, for melting metals.

CHOA'VA; a name for coffee.

CHOCOLATE, a kind of fat cake prepared from the nuts of the cacao. See CACOA. The nuts are roasted, and, well cleared from their husks, pounded in a mortar to a coarse mass, which is afterwards ground as fine as possible in the same vessel made hot. When sufficiently triturated, it is put into tin moulds, where it congeals in a very short time.—This is the common chocolate, as prepared in England from the cacao alone, without any other ingredient. Some improvements however have been practised of late years to render chocolate more wholesome and unexceptionable. These are approved by Dr. Cullen, who, speaking of chocolate in his lectures on the materia medica, says "one of the most considerable of the oily farinacea, is the *Cacoa* or Chocolate. How it may differ in its farinaceous part, from that matter in the other seeds, I cannot perceive: but it seems to be very intimately blended with the oily part, as it exists in the nut; and it seems also particularly fit for being *united by triture, with that oil* when it has been anywise before separated. With this farina the oil seems to be in as large proportion as in any other of the oily farinacea; and this oil, while it is equally bland as in any of the others, has this superior quality, that it is *much less liable than any of them to become rancid.*"

From these circumstances, the Doctor concludes, that "chocolate must be equally nutritious with any other such substance, and perhaps less offensive to the stomach. "This substance, however," he adds, "is not always easily digested, and has sometimes caused all the inconveniences in digestion that have happened from the others; but it appears that these may be in a great measure obviated by a very diligent triture, uniting very intimately the farinaceous and oily parts. This seems to be attempted in every preparation of Chocolate for food: but it seems to be no where executed so perfectly as at London; where, instead of the levigation formerly practised, it is made to pass between two cylinders rolled against one another. The chocolate thus prepared can be very equally diffused, and almost dissolved, in water or milk, and that without showing any particles of oil floating separately on the surface; which, however, happens to every other preparation of it that I have seen." Hence it appears, that chocolate is always more easily digested, as its oily and farinaceous parts are, by this preparation, more intimately united together.

CHOKE-DAMP; a noxious gas found in many caverns, as in the *Grotta del Cani*, in mines, wells, and other deep pits. This gas is called *choke-damp* by the English miners. It is heavier than common air, therefore lies chiefly at the bottom of pits; it extinguishes flame, and, is noxious to animals. It is reckoned of the same kind as the calcareous gas, i. e. carbonic acid.

CHOLAGO'GA, (from χολη, *bile*, and αγω, *to drive out* or *evacuate)*; CHOLAGOGUES. By these, the ancients meant only such purging medicines as expelled the internal fæces, which resembled the cystic bile in their yellow colour and other properties. We retain the word for such purgatives as are found most useful when bile offends, or are of service when the liver is diseased. Of this kind are antimony and calomel, which are supposed to act more powerfully on bile than any other medicines. Under this description, aloes may also be considered, being generally useful in occasioning the bile to pass freely into the intestines.

CHO'LAS, (χολας; from χολη, *bile)*; all the cavity of the ilium is so called, because it contains the liver, which secretes the bile.

CHOLE'DOCHUS DUCTUS, (χοληδοχος; from χολη, *bile*, and δεχομαι, *to receive;* receiving or retaining the gall), called also *ductus communis choledochus;* the common biliary duct, which conveys both cystic and hepatic bile into the intestinum duodenum. The cystic and hepatic ducts, Dr. Monro says, do not, in their ordinary and natural situation, represent the capital Greek Υ, where they form the ductus choledochus. After the incurvation of the neck of the vesicula, these two ducts run very near each other, and they appear to be separated only by raising up the liver to view them. The same disorder happens in an inverted liver extra situm; for then the body of the liver subsides and is flattened, and thereby separates the ducts; whereas, in its true situation, it is very much incurvated, and the ducts very near each other.

The ductus choledochus appears rather to be a continuation of the ductus cysticus, than the common trunk of that and of the ductus hepaticus; for this last duct runs for some space within the sides of the former, before it opens into the cavity, much in the same manner as the ductus choledochus passes into the duodenum. Winslow has observed, at the opening of the hepatic into the cystic duct, a small loose valvular membrane, which may hinder the bile from returning out of the ductus choledochus into the hepaticus. But later anatomists de-

scribe only a sharp angle at the meeting of the cystic and hepatic ducts, similar to the bifurcation of the arteries or veins, and in this respect they are more accurate.

The bile, which passes through the ductus hepaticus into the choledochus, may be called *hepatic;* and that which is collected in the gall-bladder, may be properly termed *cystic.* The hepatic bile flows continually through the ductus choledochus into the duodenum; whereas the cystic bile flows only by reason of its redundancy, or by compression. See Gall-bladder.

CHO'LERA, (χολεϱα; from χολη, *bile*, and ϱεω, *to flow*); a genus of disease arranged by Cullen in the class *neuroses*, and order *spasmi.* There are two species of this genus; 1. *Cholera spontanea*, which happens, in hot seasons, without any manifest cause. 2. *Cholera accidentalis*, which occurs after the use of food that digests slowly, and irritates the primæ viæ.

The cholera shows itself by excessive vomiting and purging of bilious matters, with violent pain, inflation, and distention of the belly. Sometimes the patients fall into universal convulsions; and sometimes they are affected with violent spasms in particular parts of the body. There is a great thirst, a small and unequal pulse, cold sweats, fainting, coldness of the extremities, and hiccough; and death frequently ensues in twenty-four hours.

Dr. Fordyce speaks of this disease in the following way:—When the whole *primæ viæ* are considerably affected at the beginning, sickness, pain, flatulency, and distention of the belly come on, and are accompanied by frequent vomitings and painful purging of bile, and of all the other fluids secreted into the intestines, together with the symptoms of irritation, viz. a frequent and sometimes small and unequal pulse, heat, great anxiety and thirst, and after some time, cold sweats, and spasmodic contractions of the extremities: the patient sinks sometimes in twenty-four hours, and it is called the *cholera morbus.*

Those who have been rendered weak or irritable by a hot or long-continued summer, or by living in a warm climate, or in putrid vapour, are peculiarly liable to this disease. It is produced by cold, or putrid vapour, or arises as a partial evacuation in fever, or from a purging from any cause, if it has either continued long, or happened in a habit predisposed; or it begins with phlegmonous inflammation of the intestines.

In this disease, as much bile is deposited in the alimentary canal, particularly in the stomach, the first object is to counteract its influence, and to promote an easy discharge of it. It is next necessary to restrain that increased secretion of bile, by which a fresh deposition in the alimentary canal would otherwise be soon produced. And, in the last place, measures must often be employed to restore a sound condition to the alimentary canal, which is frequently much weakened by the violence of the disease.

On these grounds, the cure is effected by giving the patient a large quantity of warm water, or very weak broth, in order to cleanse the stomach of the irritating matter which occasions the disease, and injecting the same by way of clyster, till the pains begin to abate a little. After this, a large dose of opium is to be given in some convenient vehicle, and repeated as there is occasion. But if the vomiting and purging have continued for a long time before the physician be called, immediate recourse must be had to the laudanum, because the patient will be too much exhausted to bear any further evacuations. Sometimes the propensity to vomit is so strong, that nothing will be retained, and the laudanum itself is voided as soon as swallowed. To settle the stomach in these cases, Dr. Douglas, in the Medical Essays, recommends a decoction of oat-bread, toasted as brown as coffee; and the decoction itself ought to be of the colour of weak coffee. He says he does not remember that this decoction was ever vomited by any of his patients, An infusion of mint-leaves, or good simple mint-water, is also said to be very efficacious in the same case.

The tincture of opium is sometimes retained when given in conjunction with a portion of the vitriolic acid properly diluted. But when it cannot be retained in a fluid form by the aid of any addition, it will sometimes sit upon the stomach when taken in a solid state.

Dr. Fordyce says, in the treatment of *cholera morbus*, if the vomiting, purging, and other symptoms be very severe, chicken-broth without salt, decoction of barley, solution of gum-arabic, or any other mucilaginous fluid, is to be drunk plentifully, to prevent the inflammation from being increased by the efforts, or by the neutral salts in the matter secreted, until the patient is sufficiently reduced to render the exhibition of opium safe. If they be not in so great a degree, a small quantity of antim. tartar. (gran. $\frac{1}{4}$ ad gr. ss.) or some other relaxant, may be given dissolved in part of the liquor, and repeated in three or four hours: or, if the vomiting be not very troublesome, from twenty to thirty grains of rhubarb may be taken with advantage, the patient drinking some of the above mentioned liquors.

When the strength is reduced by the evacuation, and the *primæ viæ* cleared of feculent matter by this treatment, the vomiting and purging are to be stopped by opiates; but if the patient should be so much weakened by the evacuation and irritation before any assistance is called in, as to be in danger of sinking, they are to be exhibited immediately. In both cases, the opiate is to be repeated in a smaller

dose, at six or eight hours' interval, for two or three days, taking care to keep the intestines free from feculent matter, by procuring one evacuation every twenty-four hours, if it does not take place naturally.

After the violence of the disease is overcome, the alimentary canal, and the stomach in particular, requires to be braced and strengthened. With this view recourse is often had with advantage to different vegetable bitters, particularly to the use of the columbo root; which, while it strengthens the stomach, is also observed to have a remarkable tendency in allaying a disposition to vomiting, which often remains for a considerable time after the cholera may be said to be overcome. The following formula of Dr. Saunders may be employed :

℞ Colomb. in pulv. trit. gr. x.
Rhabarb. pulv.
Ferri rubigin. sing. gr. v.
Fiat pulvis, vel, syrupo zingiberis, bolus, bis quotidie capiendus.

Dr. Hugh Smith says, the intentions of cure consist in diluting and expelling the acrid bile, and palliating the most urgent symptoms. The first intention may be answered by diluting drinks, taken in large quantities; such as a decoction of a crust of bread, water-gruel, chicken or any other thin broth, and the like; and, if at the same time vomiting should be excited, the bile may be both diluted and expelled. To palliate the symptoms, opiates, especially if joined with gentle cathartics, will most avail.

℞ Rhabarb. in pulv. trit. gr. x.
Tinct. opii gtt. xx.
Misce fiat bol. repetend. ut opus erit.

℞ Tinct. Rhabarb.
Aq. Menthæ pip. sing. ℥j.
Tinct. opii gutt. xx.
Misce fiat haustus.

CHOLICE'LE, a swelling formed by the bile, morbidly accumulated in the gall-bladder.

CHOLO'SIS, (χωλωσις); in Vogel's *Nosology*, a genus of disease, which he defines to be lameness, from one leg being shorter than the other.

CONDRI'LLA, GUM SUCCORY, a genus in Linnæus's botany. There are three species.

CHONDROLO'GIA, (χονδρολογια; from χονδρος, *a cartilage*, and λογος, *a discourse*), *Chondrology*; a discourse or treatise on cartilages.

CHONDROSYNDE'SMUS, (χονδροσυνδεσμος, from χονδρος, *a cartilage*, and συνδεω, *to tie together*); a cartilaginous ligament.

CHONDRO-PHARYNGÆ'US; a muscle which rises from the cartilaginous appendage of the os hyoides, and, is inserted into the membrane of the fauces.

CHO'NE, (χωνη); a name for the infundibulum.

CHO'PIN, an English wine quart measure.

CHO'PIN, or CHOPINO, a pint measure at Paris. Some say it contains fifteen ounces and a half; others, that it contains sixteen ounces. In Scotland the Chopin is only half of the French pint.

CHO'RDA, (χορδη, from χορδευω, *to roll up like a cord*); properly a musical *chord*, but metaphorically used to signify a tendon or nerve. In venereal cases, a *chord* is formed by the inflamed vessels and absorbents running along the penis, from an inflamed chancre. See BUBO.

CHO'RDA MAGNA, an old name for the *Tendo Achillis*.

CHO'RDA TY'MPANI. The fifth pair of nerves from the brain divides into three capital branches, one of which is called the inferior maxillary: a branch of this forms the lingual, which soon is accompanied by a small distinct nerve, which runs upward and backward towards the articulation of the lower jaw, in company with the lateral muscle of the malleus, and passes through the tympanum, between the handle of the malleus and the long neck of the incus, by the name of the *chorda tympani*.

CHO'RDÆ TENDI'NEÆ. From the edge of the valves in the ventricles of the heart, there are tendinous strings thus named, which arise from the fleshy columnæ in the two cavities, and lead to the internal structure of the heart. See HEART.

CHO'RDÆ WILLI'SII. This name is given to the small fibres which cross the sinuses of the dura mater. They are so termed because Willis was the first anatomist who described them.

CHORDEE, (*chordé*, Fr. or *chorda*; and *chordé*, from χορδη, the *chord* of a musical instrument); a painful, involuntary erection of the penis, happening at all times, but more commonly when the patient is warm in bed; under which circumstance, the penis becomes hard and painful to the touch, and is most frequently curved downwards in a considerable degree. It sometimes remains, after the heat of urine, and other symptoms of gonorrhœa, are gone off; but is usually more severe during the continuance of the inflammation, and becomes more or less violent, according to the greater or lesser degree of that symptom.

Mr. Bell states, that *chordee* is the effect of inflammation, which proceeds from irritation, communicated from the nerves of the urethra to those of the contiguous muscles, by which those unequal degrees of contraction are produced, over the whole substance of the penis, which universally takes place in this disease.

Mr. Hunter says, the chordee appears to be *inflammatory in some cases, and spasmodic in others.* Speaking of the inflammatory, he says—" When

the inflammation is not confined merely to the surface of the urethra and its glands, but goes deeper and affects the reticular membrane; it produces in it an extravasation of coagulable lymph, as in the adhesive inflammation, which uniting the cells together, destroys the power of distention of the *corpus spongiosum urethræ*, and makes it unequal in this respect to the *corpora cavernosa penis*, and therefore a curvature on that side takes place in the time of erection, which is called a chordee. The curvature is generally in the lower part of the penis, arising from the cells of the corpus cavernosum penis of that side, having their sides united by adhesions, sometimes as it were spontaneously, at other times in consequence of the inflammation attending bad chancres. Besides this effect of inflammation, when the chordee is violent the inner membrane is probably so much upon the stretch, as to be in some degree torn, which frequently causes a profuse bleeding from the urethra, that often relieves, and even sometimes cures. As chordee arises from a greater degree of inflammation than common, it is an effect which may, and often does, remain after all infection is gone, being merely a consequence of the adhesive inflammation."

The *spasmodic chordee*, Mr. Hunter says, arises from spasm, at least it cannot proceed from the same cause with the other, if his idea of that complaint be well founded. The spasmodic comes and goes, but at no stated times; at one time there will be an erection entirely free from it, at another it will be severely felt, and this will often happen at short intervals.

In the beginning of this complaint, Mr. Hunter sometimes advised bleeding from the arm, but, he says, it is of more immediate service to take away blood from the part itself by leeches; for we often find, by a vessel accidentally giving way in the urethra, and a considerable hæmorrhage ensuing, that the patient is greatly relieved. "Fomenting the penis by holding it over the steam of warm water will give ease, as will also poultices; and if camphor be added to the fomentation and poultice, it will in many cases assist in taking off the inflammation. Opium given internally is of singular service, and if joined with camphor the effect will be still greater; but opium in such cases acts rather by lessening the pain than by removing the inflammation, though by preventing erections it may be said to obviate the immediate cause of the complaint."

For a chordee continuing after all other symptoms are gone, Mr. Hunter thinks evacuation seldom necessary, the inflammation being gone and a consequence of it only remaining, which, he says, will go off gradually by the absorption of the extravasated coagulable lymph. Rubbing the parts, however, with mercurial ointment will promote the absorption of the extravasated coagulable lymph, for we find that mercury has considerable powers in exciting absorption; and the friction also will be of use. In one case Mr. Hunter thought he saw considerable benefit from giving cicuta, after he had tried the common methods of cure to no purpose. Bark and electricity may also be of service in such cases; but evacuations, whether from the part, or from the constitution, generally do harm rather than good.

A chordee is often longer in going off than either the discharge or the pain, but its declension is generally gradual and uniform, as is the case with most of the consequences of inflammation.

CHO'REA SA'NCTI VI'TI, (*Chorea*, χορεια, from χορος, *a chorus*, which, anciently, accompanied dancing); St. Vitus's dance. Horstius says, that there were some women, who, once every year, paid a visit to the chapel of St. Vitus, near Ulm, and there exercised themselves day and night in dancing, being disordered in mind, till they fell down like those in an ecstasy. Thus, they were restored till the return of the following May, when they were again seized with a restlessness and disorderly motion of their limbs, so as to be obliged, at the anniversary feast of St. Vitus, to repair again to the same chapel for the sake of dancing. From this tradition, a sort of convulsion, to which girls are principally subject before the eruption of the menses, took its name. But yet the disorder above described by Horstius is different from what we call the St. Vitus's dance. Drs. Mead and Pitcairn, say it is a paralytic affection; Sydenham, that it is convulsive; Bliss and Cheyne say it is also paralytic. Dr. Cullen calls it *chorea*, and ranks it in his class *Neuroses*, and order *Spasmi*.

This singular disease shows itself first by a kind of lameness or instability of one of the legs, which the patients draw after them in a ridiculous manner: nor can they hold the arm of the same side still for a moment; for if they lay it on their breast, or any other part of their body, it is immediately forced away by a convulsive motion. If they be desirous of drinking, they use a number of odd gesticulations before they can bring the cup to their mouths, because their arms are drawn this way and that by the convulsions which affect them. The general cause of St. Vitus's dance is a debility of the system; and hence we find it attacks only weakly boys, and more especially girls, when under the age of puberty. But the particular causes determining the muscles to be affected in such and such a manner are entirely unknown. As this disorder scarce ever attacks any persons but such as are under the age of puberty, there is almost a certain prospect of its being then cured, though generally the complaint is easily removed before that time. The cure of this disease is to be attempted in the way directed under Epilepsy. Dr. Smith advises the following means to be used

for the cure. It may be necessary to premise an emetic of ipecacuanha; or, what is still better, a grain or two of vitriolated copper. Afterwards,

℞ Auri musivi, ℈j ad ʒi.
Rhabarb. gr. iv. ad ℈ss.
Misce fiat Pulv. mane et vesp. sumend.

Or,

℞ Limatur. stanni ʒss. ad ʒij.
Cons. rutæ q. s. ut ft. Bol. mane et vesp. sumendus.

℞ Tinct. fœtid. ℥j.
Sumend. gut. xxx. ad ʒij. ter quaterve de die.

If the disease should not yield to the above, the cold bath and chalybeates will most probably be useful. The remedies directed in the treatment of epilepsy may also be adopted, as circumstances may require.

Dr. Saunders says, that in some cases of plethora it may be necessary to bleed. In almost all cases, a brisk purgative or two ought to precede the tonic and antispasmodic remedies to be afterwards employed. Of this kind are bark and iron, valerian in large doses, preparations of zinc and copper; and, in some cases, the *oleum succini*. He directs our attention to the treatment employed in the epilepsy, and also to the following formulæ :

℞ Cinchonæ flav. in pulv. trit. ℥j,
Chamæm. flor. pulv. ℥ss.
Ferri rubigin. ʒiss.
Syr. aurant. cort. q. s.
Fiat Electuarium, de quo sumat quant. nucis mosch. ter quotidie.

℞ Extr. cinchon. moll. ʒiss.
Ferri vitriol. in pulv. trit. ℈j.
Syr. Simpl. si opus fuerit ad massam fingendam.
Fiant pilulæ triginta, quarum tres mane, meridie, vespereque sumantur.

CHO'RION, (*χοριον*; from *χωρεω*, *to escape*; because it always escapes from the uterus with the fœtus); the shaggy membrane inclosing the fœtus in utero.

The external membranous part of the impregnated ovum is originally composed of three coats: these are the internal lamella, or that next the fœtus, which is called *amnios;* the next is the *true chorion;* and the external is called the *false* or *spongy chorion*. It is supposed to derive an extraordinary lamella immediately from the uterus, which constitutes the external covering of the ovum. This production, which is supposed to be entirely formed by a continuation of the internal membrane of the uterus, is at first loosely spread over the ovum, and afterwards comes in contact with the false chorion. These two lamellæ, which form the external vascular surface of the ovum, are much thicker than the internal membranes of the true chorion and amnios; and the proportion which they bear to the other parts is so great, that, in early conception, the mass of the ovum is chiefly composed of them. Ruysch called this exterior coat the *tunica filamentosa*; but more modern authors have named it the *false* or *spongy chorion*. Dr. Hunter, however, found the spongy chorion to consist of two distinct layers; that which lines the uterus he styles *membrana caduca* or *decidua*, because it is cast off after delivery; the portion which covers the ovum, he names *decidua reflexa*, because it is reflected from the uterus upon the ovum. The membrana decidua has three foramina, viz. two small ones, corresponding with the insertion of the tubes at the fundus uteri; and a larger ragged perforation opposite to the orificium uteri.

Thus it appears, according to Dr. Hunter, that the embryo, on its first formation in the ovum, and the fœtus during the whole time of gestation, is inclosed in four membranes, viz. the double, false, or spongy chorion, called *membrana decidua*, or *decidua reflexa*; the true chorion, and the amnios, which hold a fluid called the *liquor amnii*, in which the embryo floats.

The true chorion and the amnios are very thin transparent membranes. The decidua, and decidua reflexa, differ in appearance, and seem to resemble those inorganic substances which connect inflamed viscera, and have been considered, by some writers, as composed of coagulated lymph.

CHO'RION LÆ'VE, a name given, by Dr. Monro, to a white opaque membrane, not vascular, lying under the false chorion. He says—"Under the spongy chorion lies a continuous, white, opaque, and firm membrane, and not vascular; it does not cover the part of the placenta turned towards the uterus, but is concave, and turned to the fœtus. It coheres by a cellular texture both to the spongy chorion and amnios. The most simple name we can give it is that of *chorion læve*."

CHOROI'DES TU'NICA, (from *χοριον*, *the chorion*, and *ειδος*, *resemblance*); the choroid coat, or membrane. It forms the second tunic of the eye, lying immediately under the sclerotica, to which it is connected by vessels. The true knowledge of this membrane is necessary to a perfect idea of the iris and uvea. The tunica choroides is of a blackish colour, more or less inclined to red, and adheres, by means of a great number of small vessels, to the sclerotica, from the insertion of the optic nerve all the way to the cornea, where it leaves the circumference of the globe, and turns

inward, to form a number of little processes termed *ciliary*, which are situated at the edge of the crystalline lens.

The external lamina of the choroides is stronger than the internal, and is of a brownish colour. At a very small distance from the cornea, this lamina is most closely united to the sclerotica, by means of a whitish ring called *ciliary ligament*, or *ciliary circle*; and near the edge of the sclerotica, this ring is stronger, and of a different texture from what it is any where else. The choroides adheres so closely to the sclerotica, that if we blow through a small hole made in it, without touching the choroides, the air will penetrate every where between the two coats, but cannot destroy this adhesion, or pass to the cornea. On the inner surface of this lamina we discover a great number of flat lines in a vortical disposition, which are the vessels named by Steno *vasa vorticosa*, or *vortices vasculosi*.

The internal lamina of the choroides is thinner, and of a darker colour, than the external; it is formed of a black varnish, which is thicker before than behind, and is wanting at the entrance of the optic nerve. At the fore-part of the eye it lies only between the ciliary processes, leaving them white, and adheres to the vitreous humour, forming there a radiated ring. The origin of this substance has not as yet been detected; but, after a nice anatomical injection, Winslow observed a great number of vascular stars on its inner surface. By Ruysch, this coat is termed *Membrana Ruyschiana;* the term *membrana*, at least, is most proper.

CHOROI'DES PLEXUS, or Plexus Choroidea; a plexus of blood-vessels, situated in the lateral ventricles of the brain. The plexus choroides is a very fine vascular texture, consisting of a great number of arterial and venal ramifications, partly collected in two loose fasciculi, which lie on each lateral ventricle, and partly expanded over the neighbouring parts, and covering, in a particular manner, the thalami nervorum opticorum, glandula pinealis, tubercula quadrigemina, and the other adjacent parts, both of the cerebrum and cerebellum, to all which it adheres. See Cerebrum, and r, r, in pl. xviii.

In each lateral portion of its plexus, we observe a veinous trunk, the ramifications of which are spread through the whole extent of the two portions. Near the glandula pinealis these two trunks approach each other, and, uniting behind that gland, they open into the torcular or fourth sinus of the dura mater. When we blow into one of these trunks towards the plexus, the air passes into all its ramifications; and, in some subjects, these two veins form one trunk, which opens into the sinus.

The loose portions of the plexus choroides often appear to contain a great number of tubercles like glands, which, in the natural state, are extremely small, but grow bigger in diseases. To be able to examine them as we ought, the loose portions must be made to swim in clear water, and be there carefully expanded. By the help of a microscope, we then see these tubercles in the natural state, like small folliculi, or little bags, more or less flatted.

Besides this vascular web, or plexus of the septum lucidum, the sides of the fornix, of the eminences, ventricles, canals, and infundibulum, are all covered by a very fine membrane, in which, by injections or inflammations, we discover a great number of very fine vessels. This membrane, is in a manner, a continuation of the plexus, and that seems to be a detachment from the pia mater. By the same means we likewise discover an extremely thin membrane on the insides of the duplicature of the septum, though, in some subjects, these sides touch each other.

CHOWDER-BEER, a provincial phrase of Devonshire, denoting a cheap and easily prepared drink, highly commended for preventing the scurvy in long voyages, or for the cure of it where it may have been contracted. It is prepared in the following manner:—Take twelve gallons of water, in which put three pounds and a half of black spruce: boil it for three hours, and having taken out the fir or spruce, mix with the liquor seven pounds of melasses, and just boil it up; strain it through a sieve, and when milk-warm put to it about four spoonfuls of yeast to work it. In two or three days stop the bung of the cask; and in five or six days, when fine, bottle it for drinking. Two gallons of melasses are sufficient for an hogshead of liquor; but if melasses cannot be procured, coarse sugar will answer the purpose.

CHRI'SOM, or CHRISMA'LE, was anciently the face-cloth, or piece of linen laid over the child's head when it was baptised. Whence, in our bills of mortality, children who die in the month are called *chrisoms*. The time between the child's birth and baptism was also called *chrisomus*.

CHRISTMAS ROSE. See Helleborus Niger.

CHROA'STACES, a genus of pellucid gems, comprehending all those of various colours, if viewed in different lights; of which kinds are the *opal* and the *asteria*.

CHRO'ME, (from χρωμα, *colour*; because its primary combinations impart its colour to all secondary ones); a white metal, inclining to grey, very brittle in its texture, and crystallizable at an elevated temperature, in feathered filaments on the surface. Its internal fracture presents, in some parts, close grains, in other parts, needles crossing each other. It is an ingredient in the fossil, known by that name in Siberia. It is not as yet applied to any use in medicine.

CHRO'NICUS, (χρονικος, from χρονος, *time*); chronical or chronic, an epithet applied to those

diseases which continue long, and are without any fever, or, at least a considerable degree of it. They are thus called, to distinguish them from those attacks which proceed rapidly and terminate soon, these last being called Acute.

CHROSTA'SIMA, a genus of pellucid gems, comprehending all those which appear of one simple and permanent colour in all lights; such are the diamond, carbuncle, ruby, garnet, amethyst, sapphire, beryl, emerald, and the topaz. See Diamond, &c.

CHRU'PSIA, (χρυψια; from χρυα, *colour*, and οψια, *sight*), also called *visus coloratus;* a disease of the eyes, in which the person perceives objects of a different colour from what is natural to them.

CHRYSA'NTHEMUM, (χρυσανθεμον; from χρυσος, *gold*, and ανθεμος, *a flower*); the corn-marygold. Many herbs are so called whose flowers are of a bright yellow colour.

CHRYSA'NTHEMUM LEUCANTHEMUM; the systematic name of the great ox-eye-daisy. See Bellis major.

CHRYSI'TIS, or Chrysitis Spodos, a name for litharge.

CHRYSI'TRIX, a genus in Linnæus's botany. He has but one species.

CHRYSOBA'LANUS, the cocoa plum; a genus of the monogynia order, belonging to the icosandria class of plants. There is only one species, the *Icaco*, which is a native of the Bahama islands and many other parts of America, but commonly grows near the sea. It rises with a shrubby stalk eight or nine feet high, sending out several side branches which are covered with a dark-brown bark. The flowers are white, and are succeeded by plums like damsons; some blue, some red, and others yellow. The stone is shaped like a pear, and has five longitudinal furrows. The plums have a sweet luscious taste, and are brought to the tables of the inhabitants, by whom they are much esteemed.

CHRYSOCO'MA, (from χρυσος, *gold*, and κομη, *hair*), goldylocks; a genus in Linnæus's botany. He enumerates thirteen species.

CHRYSOCO'MA; a name of several species of Helichrysum.

CHRYSO'GONUM, (from χρυσος, *gold*, and γινομαι, *to be made*, or *generated of*); a genus in Linnæus's botany. There is one species.

CHRYSO'GONUM; Grecian lion's-leaf, a species of leontice.

CHRYSOLA'CHANON, garden or white orache.

CHRY'SOLITE, (χρυσολιθος); a precious stone, a species of quartzose crystal. Chrysolites are met with amongst the species of two different genera in the order of *Quartz*.

CHRY'SOMS, (from χρισμα, *unctio*, anointing). Anciently children were anointed as soon as born, with some aromatic compositions; and, upon the head they wore an anointed cloth, till they were judged strong enough to endure baptism; after which that cloth was left off. From the birth to that time, was accounted a particular period of the child's life, and deemed a state of unction; and hence, our bills of mortality seem to derive their distinction of *chrysoms*, for all who die before they are baptised.

CHRYSOPHY'LLUM; the star-apple-tree, a genus in Linnæus's botany. He enumerates three species and four varieties.

CHRYSO'SPLE'NIUM; golden saxifrage, a genus in Linnæus's botany. There are two species.

CHU', or chus; the name of a measure.

CHU'NNO; the Peruvian name for potatoe-bread.

CHURNING, the operation of making butter (see Butter), by agitating milk in a well-known vessel called a churn. The theory of it, according to Dr. Cullen, seems to depend upon this: "that the oily parts of milk are very minutely diffused among the other parts of it, and connected with them by the attraction of adhesion; but, as the attraction of the oily parts towards one another should be still greater than towards the other parts of the milk, it is only necessary, by some agitation of the whole, to bring the oily parts in contact with one another, in order to unite them together, and thereby make them separate themselves more readily and copiously. As the process succeeds without the escape of air, or other mark of any fermentation, and succeeds under the admixture of various substances, it is probable that it depends upon the agitation alone, operating in the manner we have said." This theory of churning, the doctor supposes to be confirmed by its explaining, at the same time, the effects of boiling, which, in the Devonshire practice, allows butter to be procured from cream with much less agitation than is in other cases necessary. It is to be considered, however, that the means by which the oily part of milk is obtained in its separate state, do not materially affect its nature and peculiar qualities as an article of food.

CHYLE; the milk-like liquor, which is observed, some hours after eating, in the lacteal vessels of the mesentery, and in the thoracic duct. It is separated by digestion from the chyme, and is that fluid substance from which the blood is formed.

That its principal composition is of water and oil, seems evident from the sweetness of its taste, from the whiteness of its colour, from its acescent and coagulable nature, and from its lightness, by which it swims on the blood; in all which properties it very much resembles an emulsion. It is composed of a vegetable farina, with animal lymph and oil. It every where retains the properties of the volatile and oily aliments. It changes into milk with very little alteration. But afterwards it becomes more manifestly glutinous; since the pellucid

serum it contains, either by exhaling the watery part, or by applying an intense heat, coagulates into a kind of jelly.

Haller has attributed the first cause of motion in the chyle, and of its absorption, chiefly to the attraction of the capillary vessels, which observe alternate pulses with the peristaltic contraction of the intestine. The attractile force fills the villosity; and moves the chyle farther forward. The rest of its motions seem to depend on the strength of the membrane of the lacteal vessel itself, which, even after the death of the animal, expels the chyle, so that the vessels become pellucid which before were milky. The alternate compressing force of the diaphragm is also of some efficacy in this case.

The chyle, mixed with the blood, does not immediately change its nature, as we learn from the milk which is afterwards made of it; but, after it has circulated through the body, fomented with heat, and mixed with a variety of animal juices, it is at length so changed, that a part of it is deposited in the cellular substance under the denomination of fat; a part of it is configured into the red globules; another part changes into serum; and the watery parts go off, in some measure, by urine, in some measure by perspiration; while a small part is retained in the habit to dilute the blood.

Dr. Fordyce says, that "chyle is not formed in the stomach. Sometimes a little whitish matter is seen about the pylorus; but, if it were perfect chyle, it would be absorbed, and shown, as was before said, in the absorbents of the stomach, which it is not; even if, in the middle of the digestion, the pylorus is tied round by introducing a piece of tape, and forming a ligature round it, and retaining the remaining food in the stomach. The matter formed in the stomach is therefore converted in the duodenum, and continues to be converted in the jejunum into chyle.

"As the coagulating juice of the stomach, as far as we can judge, does not all, or any part of it, enter into the matter formed from the food in the stomach, and the other juices of the stomach, only in so far as they apply water, these juices of the stomach only assist in regulating the process of the stomach and the food; so neither do the juices of the duodenum, either the bile, pancreatic juice, fluids secreted in the glands of the duodenum, or which may pass through the exhalents, at all appear to enter into any part of the chyle. For if in the body, when it is whole, a stone should obstruct the ductus communis choledochus, so as to prevent bile altogether from getting into the duodenum; or if we open the body of an animal, when food has been thrown into the stomach, and tie up the ductus choledochus, so as to prevent any bile from getting into the duodenum; in either case chyle is formed without any particle of bile being admixed; and the same may be said of the pancreatic juice; so that chyle is solely the product of the matter formed by the digestive process of the stomach.

"Chyle in itself is always the same, but not always in the same quantity in proportion to the food. For in the stomach itself, when a great quantity of food is thrown in, part of it may be digested and converted into the substance formed by the process of the stomach, and part of it may be sent into the duodenum to pass off unaltered; which, however, is often dubious, because, on examining the food in the duodenum, we hardly ever find any digestible matter in the form it was thrown into the stomach. If the whole of the food be converted into the matter formed by the process of the stomach, in the duodenum part may be converted into chyle, and part be passed forward without any farther change. Or that part which was not converted into chyle, may be converted into some other substance which may pass through the lacteals into the blood-vessels, and be evacuated by the different excretories of the body. Or the whole being converted into chyle, part of that chyle may be formed into blood, and part of it may undergo some other process, which may render it capable of passing off through the different excretories, or deposit it in some of the cavities of the body out of the course of circulation."

CHYLI'FERA VASA, or LACTEA VASA. See LACTEALS.

CHYLIFICATION, (from *chylus*, and *fio*, to make); the process carried on in the small intestines, and principally in the duodenum, by which the chyle is separated from the chyme. See DIGESTION, and CHYLE.

CHYLOPOIE'TIC, (χυλοποιετικος; from χυλος, *chyle*, and ποιεω, *to make)*; an epithet denoting any thing connected with the formation of chyle. Thus we speak of the chylopoietic viscera, chylopoietic vessels, &c.

CHYME, *(chymus*, from κυμος, which signifies *humour* or *juice)*; the ingested mass of food, as it passes from the stomach into the duodenum, and from which the chyle is prepared in the small intestines by the admixture of the bile, &c. See CHYLE, and DIGESTION.

CHY'MIA; chemistry. See CHEMISTRY.

CHYMIA'TER; a chemical physician, or one who cures by chemical medicines.

CHYMO'SIS, (from χυμος, *succus*, of χεω, *fundo*, to melt); the act of making or preparing chyme. Chymosis was formerly used to signify the second of the concoctions made in the body; namely, a repeated preparation of the gross parts of the chyle, which being rejected by the lacteals, entered by the meseraics, and thence passed to the liver, to be there elaborated, purified, and subtilized afresh.

CHY'NLEN, the name of a cylindrical root, of the thickness of a goose-quill, brought from China. It has a bitterish taste, and imparts a yellowish

tinge to the saliva. The Chinese hold it in high estimation as a stomachic, when infused in wine; but it is little known in this country.

CIBDELOPLA'CIA; a genus of spars debased by a very large admixture of earth. They are opaque, formed of thin crusts, covering vegetables and other bodies, by way of incrustation. Of this genus we have the following species: 1. A greyish white one, with a rough surface. 2. A whitish brown one: both these are friable. 3. A hard, pale-brown kind, which is the osteocolla of the shops. 4. The whitish-grey kind, with a smooth surface: this is the unicornu fossile and ceratites of authors. 5. The whitish-brown coralloide kind.

CIBDELOSTRA'CIA; terrene spars, destitute of all brightness and transparence, formed into thin plates, and usually found coating over the sides of fissures, and other cavities of stones, with congeries of them of great extent, and of plain or botroyide surfaces. Of these there are usually reckoned seven kinds: 1. The hard, brownish-white cibdelostracium, found in Germany. 2. The hard, whitish cibdelostracium, with thin crusts, and a smoother surface, found also in the Harts-forests in Germany. 3. The hard, pale-brown cibdelostracium, with numerous very thin crusts, found in subterranean caverns in many parts of England as well as Germany. 4. The white, light, and friable cibdelostracium, found also in Germany, but very rarely in any part of England. 5. The light, hard, pale-brown cibdelostracium, with a smooth surface, found in almost all parts of the world. 6. The whitish, friable, crustaceous cibdelostracium, with a rougher surface, frequent in Germany and England. 7. The brownish-white friable cibdelostracium, with a dusty surface, found in several parts of Ireland, as well as Germany.

CI'BUS ALBUS, white-food; a species of jelly, directed in Fuller's pharmacopœia. The Spaniards give the name of cibus albus, to a certain American plant.

CICATRI'CULA, among natural historians, denotes a small whitish speck in the yolk of an egg, supposed to be the first rudiments of the future chick. See Egg.

CICA'TRIX; that seam or elevation of callous flesh, or skin, remaining after the healing of a wound or ulcer, and is commonly called a scar. It is the destruction of the cellular membrane by inflammation that causes cicatrices to tuck inwards, as they are always observed to do. It is remarkable that this new covering never becomes genuine skin; as is evident from the separation of the cicatrices of the skins of brute animals, submitted to tanning and other such like processes. Hence the holes which are frequently seen in leather.

CICA'TRIZANTS; medicines which assist nature to form a cicatrix. Such are most of the astringent earths, &c. By the old surgeons, these were also named *epulotics*, *incarnatives*, *agglutinants*, &c.

CI'CCA; a genus in Linnæus's botany. He has but one species.

CI'CER; (a word of uncertain origin, unless it be from the Greek, κικυς, *strength*. The Cicerones had their name from this pulse, as the Pisones had from the pisum or pea, and the Lentuli from the lens or lentil.) Ερεβινθος. The seeds of this plant, *cicer arietinum; foliis serratis*, Linn. have been employed medicinally, but are now fallen into disuse. In some places they are toasted, and used as coffee; and in others, ground into a flour for bread. The colour of the aryllus of the seed, is sometimes white, red, or black: hence the distinction into *cicer album*, *rubrum*, and *nigrum*.

CI'CER ARIETI'NUM; the systematic name of the cicer plant. See Cicer.

CI'CERA, Spanish *chickling-vetch*, a species of Lathyrus.

CI'CERA TA'RTARI; small pills composed of turpentine and cream of tartar.

CICHO'RIUM, (an Egyptian name, according to Pliny, adopted by the Greeks. It is written sometimes Κιχορειον; whence Horace has, *cichoreæ, levesque malvæ:* sometimes Κιχοριον, or Κιχωριον. It is supposed to have this name, παρα το δια των χωριων κιειν, from its creeping through the fields. Others derive it from κιχρω, *invenio;* on account of its being so readily found, or so common); succory. Also *cichorium;* wild cichory. This plant, *cichorium intybus; floribus geminis, sessilibus; foliis runcinatis*, Linn. abounds with a milky juice, of a penetrating, bitter taste.

It is a plant with oblong, dark green, hairy leaves, deeply jagged like those of dandelion, but larger; in the bosoms of which, towards the tops of the branches, the flowers come forth in spikes, consisting each of a number of blue flat flosculi, set in a scaly cup, which afterwards become a covering to several short angular seeds: the root is long and slender, of a brown colour on the outside, and white within. It is biennial, grows in hedges, and by road sides, and flowers in June and July.

It abounds with a milky juice, of a penetrating bitterish taste, and of no remarkable smell: the roots are bitterer than the leaves or stalks, and these much more so than the flowers. But, by culture in gardens, it loses its green colour, and in a great measure its bitterness, and in this state is a common sallad herb: the deeper coloured, and the deeper jagged the leaves are, the bitterer is the taste of the whole plant.

The virtue of this plant resides in the milky juice, which may be extracted by coction in water, or by pressure. The wild and the garden sorts may be used indifferently, but should be used as food rather than physic.

The herb, root, seeds, and flowers, have, how-

ever, been used medicinally, in the cure of intermittents, and as aperients in hectic and inflammatory affections.

CICHO'RIUM ENDI'VIA; the systematic name of the common ENDIVE. See ENDIVIA.

CICHO'RIUM I'NTYBUS; the systematic name of the wild CICHORY. See CICHOREUM.

CICHORY. See CICHORIUM.

CICHORY, WILD. See CICHORIUM.

CICI'NUM OLEUM, (Κικινος; from κικι, the *ricinus)*; an oil, obtained by boiling the bruised seeds of the *jatropha curcas*, Linn. It is somewhat similar in its medicinal properties to the castor oil. See RICINUS.

CICU'TA, (quasi *cœcuta*, blind, because it greatly affects the sight of those who have taken it), HEMLOCK; the *Conium maculatum*, *Conium majus seminibus striatis*, Linn. Class, *Pentandria*. Order, *Digynia*. This plant, whose virtues have so long and so greatly agitated the opinions of medical men, grows wild in almost every part of the world. With us it is found about the sides of the fields, under hedges, in moist shady places. For a description of it, see the article CONIUM.

Dr. Cullen says, there are many instances of the fallacy of experience in matters of the materia medica; but in no instance does it appear more strongly than in the history of this vegetable. Since Dr. Storck, of Vienna, first recommended it, from his own experience, as *a most effectual remedy in many diseases*, it has been employed by practitioners in every part of Europe; and "taking in the whole of their reports, I am," says Dr. Cullen, "still at a loss to say, what are truly the powers and virtues of cicuta." It is probable, the worthy baron, from a partiality to his own discovery, and from much false information, and the hasty prejudices of those who communicated cases to him, represented its virtues as much greater than ever they were, or ever will be found to be; and many are the instances in which practitioners of the greatest candour and discernment have found this medicine to fall much short of the promises which were held out concerning it. But, Dr. Cullen says, he has known, from his own observation, that many of the trials of this medicine have been unfairly made. Sometimes the proper plant had not been employed, and frequently it had been improperly prepared. He frequently found the extract, both as prepared at Vienna and in Britain, a perfectly inert substance, and producing no sensible effects on the body, though given in very large quantities. Such, indeed, is the uncertainty of extracts of the cicuta, that many practitioners have deserted the use of that preparation; and give the preference to a powder of the dried leaves. This last, however, from improper drying or keeping, is liable also to uncertainty, and is found in a perfectly inert state, as Dr. Withering observed, in consequence of the action of *light* upon it.

"It sufficiently appears," says Dr. Cullen, "that the many failures that have been reported of hemlock *do not afford any proof of it being useless as a medicine*; and, as it has manifestly strong powers in affecting the human system, I conclude that, like all other substances possessed of such powers, it may be a very efficacious medicine. But it may still be a question, in what diseases, and cases of them, it may be of peculiar efficacy? I am at a loss, from my own experience, or that of others, to answer this question. We have known it useful in resolving and discussing schirrosities of different kinds, and particularly those of a scrophulous nature. We have also known it useful in healing ulcers which had come upon schirrous tumors, and which continued to be surrounded with such schirrosity; and in some ulcers certainly that *approached to the nature of cancer*. Even in cases that might certainly be considered as truly cancerous, I am so far from being of the opinion of Bierken of its rather aggravating the disease, that I have found it in several cases to relieve the pains, and mend the quality of the matter proceeding from the sore, and even to make a considerable approach towards healing it; though I must own that I never was concerned in a cancerous case in which the cure of the sore was completed by it."

Cicuta has been supposed useful in removing the secondary affections arising in syphilis; and one of the most competent judges on this subject, the late Mr. Hunter, found it to be so. He found reason to approve of its use, in swellings of the prostrate gland, in what is called seminal weakness, in irritability of the bladder, in spreading ulcers of the prepuce and groin, and in obstinate buboes. Mr. Justamond tried it extensively, and not without soothing effects, at least, in cancers of the uterus (see UTERUS); and Dr. Cullen says, he himself employed it in various cases with advantage, though, in several intances, he found no benefit whatever from its use. In many cases even, where it did show sensible effects, so as to preclude all suspicion of imperfection in the medicine, it failed in curing a disease, though such disease were similar to those in which it had before succeeded. Hence the Doctor is at a loss to ascertain the cases to which it is most certainly adapted; and perhaps the peculiarities of constitution and circumstances in different cases, will for ever remain an obstacle to our certain knowledge and application of this interesting remedy.

With respect to the pharmaceutic treatment of hemlock, there are different opinions concerning the proper time of gathering the plant. It has been usual in Scotland to gather it before the flowers, and even almost before the flower-bearing

stalks appear; and from some experiments, Dr. Cullen has been led to judge, that, at this period of its growth, the virtues of hemlock are the strongest. The late Dr. Fothergill preferred a more advanced period, when the flowers were falling off, and the seeds beginning to be formed; and if we do not misunderstand Bergius, he seems to be for allowing the growth to proceed still farther, and till the seeds are ready to fall off. Farther experience only can determine this matter, though Dr. Cullen believes it is of little consequence which of these practices be followed.

As both the extract and the powder of hemlock are liable to be produced in an imperfect state, it is highly desirable that we should find out the causes that they may be avoided. Unless the preparation, whichever it be, produce sensible effects on the nervous system, it cannot be a remedy in any disease; and Dr. Cullen is farther disposed to add, that *those effects must be pretty strong*, in order to render the hemlock an efficacious medicine. "The practitioner indeed," says he, "should take care, by bringing on these effects by degrees, to avoid its becoming a poison; but it is to be suspected, that by bringing on the effects too slowly, the medicine fails in many cases; and by its being gradually habituated to the system, that it has less effect than it might otherwise have had on the disease."

Dr. Storck is very fond of representing hemlock as a very innocent medicine; and certainly it has been taken for a very great length of time without any bad effects; but Dr. Cullen is certain that it may prove a poison, and that it is only by its being slowly habituated to the system that it proves, as every other vegetable poison may become, sufficiently innocent. That the gradual and cautious exhibition of it is requisite, we have many striking proofs; particularly in that case of a bubonic ulcer, related by Mr. Hunter, whose patient killed himself by taking, a large dose indeed, but only the half of what he left off with, when he chose to discontinue the medicine; an interval in which the constitution had recovered its susceptibility to the narcotic action. See Conium Maculatum. Cicuta is often applied externally with advantage, and particularly in the form of poultice, or even in that of the bruised leaves, as was the practice of Mr. Justamond, in the case of open cancers of the breast; but in the form of plaster, in which it has also been employed, it can have very little effect. A poultice of it has been useful in resolving some indurations, especially those of the scrophulous kind; but in the indolent scirrhosities in the breasts of women it is seldom of any service; and Dr. Cullen found the frequent application of hemlock poultices do much harm, by bringing the disease sooner into the state of an open cancer.

When hemlock is casually or purposely eaten, it causes a vertigo, a dimness of sight, hiccough, wild delirium, and coldness of the extremities, convulsions and death, by an utter interception of respiration: sometimes by the spasms, which it produces in the stomach and other parts, hæmorrhages are the consequence; or, which is most common, an epilepsy comes on, and this, without very speedy relief, is fatal. The only chance is to discharge the stomach of its contents by means of the most active emetics, and by the means suggested under the article Poison. The proper method of administering hemlock inwardly as a medicine, is to begin with a grain or two of the powder or inspissated juice, and gradually to increase the dose until we reach the full one, which is thus known: for the most part a giddiness affects the head; there is a motion in the eyes as if something pushed them outwards; a slight sickness, and trembling agitation of the body; a laxative stool or two the morning after a dose. One or more of these symptoms are the evidences of a full dose: and it is proper to continue at this rate until none of these effects are observed. Then, after a few days, we may increase the dose still more; for little advantage, as we have already said, can be expected but by a continuance of full doses. In some constitutions, even small doses occasion spasmodic twitchings, heat and thirst: in such instances it must be discontinued.

The only authorised officinal preparation of this vegetable is the *Succ. Spissat. Con. maculat.* Lond. Edin. Dubl. It is directed, in the Edinburgh New Dispensatory, to express hemlock, gathered when the flowers are *just appearing*, to let the fæces subside, and reduce the decanted juice to dryness in a water-bath.

CICU'TA AQUA'TICA, the water-hemlock. This plant, *Cicuta virosa umbellis oppositifoliis; petiolis marginatis, obtusis* of Linnæus, is scarcely ever employed medicinally in the present day. It is an active poison, and often eaten by mistake for the wild smallage; the *apium graveolens*, Linn. Dr. Cullen says, "the root of this plant is well known to be a strong poison both to men and brute animals, with the exception of the goats and swine of Norway, which are not hurt by it. Its deleterious powers in man are so considerable, that they have prevented its being employed as an internal medicine; though, with me, this is not a sufficient reason for our not attempting a trial of this and some other of the umbelliferous poisons. If it be true that both the roots and leaves become much milder by drying, we might probably find an intermediate state between the fresh and the dry, with which our trials of this might be made with more safety. The roots of the cicuta have been much recommended as an external remedy in many cases; but

as these recommendations have proceeded upon the alleged experience of a barbarous people, we cannot pay much regard to them."

The effects of the root, when eaten by some children in the neighbourhood of Liverpool, are described by the late Dr. Houlston, of that place, in the Edinburgh Medical Commentaries. In the event, one of five who had so eaten, died. See Poisons.

CICUTA'RIA, (from *cicuta*, hemlock); bastard hemlock; also called *wild Cicely*, or *Cowweed.* It is the *Chærophyllum sylvestre; Caule lævi, striato; geniculis tumidiusculis*, Linn. This plant is often mistaken for the true hemlock, *conium maculatum.* It may with great propriety be banished from the list of officinals, as it possesses no remarkable property.

CI'GNUS, a measure so called, containing about two drachms.

CI'LIA, the eye-lashes; a row of hairs which grow on the flat edge of each palpebra. Those belonging to the superior palpebra are bent upward, and are longer than those of the lower palpebra which are bent downward. These rows are placed next the skin, and are not single, but irregularly double or triple. The hairs are longer near the middle of the palpebræ than toward the extremities; and, for about a quarter of an inch from the inner angle, they are quite wanting.

CILIA'RE LIGAMENTUM, also called Processus ciliaris. The sclerotica joins the choroides, and round the edge of the cornea, they adhere firmly; at this circle the choroides seems to change its colour and texture, appearing as a whitish kind of ring; this ring is termed *ligamentum ciliare.* Here, the internal lamina of the choroides dips inwards, to make what are termed the *processes*, which are little folds of the inner lamella of the choroides. These folds become broader, until they terminate in a broad point in the crystalline humour. The whole radiated ring, made by the ciliary processes, is sometimes called *corona ciliaris.*

CILIA'RES GLA'NDULÆ. Along the border of the palpebræ, near the internal membrane, or toward the eye, we see a row of small holes, which may be named *foramina* or *puncta ciliaria.* They are the orifices of the same number of small oblong glands which lie in the sulci, channels, or grooves, on the inner surface of the tarsus. These little glands are of a whitish colour; and, when examined through a single microscope, they appear like bunches of grapes, those of each bunch communicating together; and, when they are squeezed between the nails, a sebaceous matter, like soft wax, is discharged through the puncta ciliaria. They are more numerous in the upper than in the under eye-lids, and were first noticed by Casserius, but afterwards described by Meibomius, by whose name they are frequently called.

CILIA'RIS MUSCULUS: this muscle is so called from *cilia*, or edge of the eye-lid where the hairs are fixed. It is that part of the musculus orbicularis palpebrarum, which lies nearest the cilia; mistaken by Riolanus, who gave it this name, for a distinct muscle.

CILIA'RIS PROCE'SSUS. See Ciliare Ligamentum.

CI'LIUM; the hair on the eyelid, and the eyelid itself.

CI'LLO, (from *cillendo*, a being in continual motion); a trembling of the upper eyelid.

CILLO'SIS, the same as Cillo.

CIMICIFU'GA, a genus in Linnæus's botany. There is but one species.

CIMO'LIA ALBA, (of the Greek κιμωλια; from Κιμωλος, *Cimolus*, an island in the Cretan sea, where it is procured); the tobacco-pipe clay. Its virtues are similar to those of the bolar earths; but it is never administered medicinally in this country.

CIMO'LIA PURPURE'SCENS, called also *Smectis*, fuller's earth. It has its latter name from σμηχω, *to scower* or *absterge.* It is a kind of marle rather than a compact earth, and, of the same qualities as bole.

CI'NARA, or Cynara, (κιναρα; from κινεω, *to move; quasi movet ad venerem*); the common artichoke. It is the *Cynara scolymus; foliis subspinosis pinnatis indivisisque, calycinis squamis ovatis*, Linn. Class, *Syngenesia.* Order, *Polygamia æquales.* This plant forms an article in the pharmacopœias. It is a native of the southern parts of Europe, but cultivated here for culinary purposes. The leaves are bitter, and afford, by expression, a considerable quantity of juice, which, when strained, and mixed with an equal quantity of white wine, it is said, has been given successfully in dropsies; but it is very uncertain in its operation. Dr. Cullen says, "of this acrid plant, the only alimentary part is the receptacle of the flower, and the portions of that which we pull away from it, in pulling away the separate squamæ of the calyx. The whole of this receptacle, even in its recent state, is of very little acrimony, and by being boiled in water is rendered perfectly mild. In its boiled state, it is of a tender texture, somewhat sweet and mucilaginous, and therefore tolerably nourishing; but it is not remarkable for any other qualities." He discredits the notion of its preventing sleep in those who eat it at supper.

CI'NCHONA; officinal cinchona, or Peruvian bark. The tree which affords this valuable medicine, is the *Cinchona foliis elliptisis subtus pubescentibus corollæ limbo lanato.* Class, *Pentandria.* Order, *Monogynia.* The corolla is funnel-shaped,

with a woolly summit; the capsule inferior, bilocular, with a parallel partition. Linnæus describes two species: 1. The corymbifera, corymb-bearing cinchona, or white Peruvian bark, with oblong lanceolate leaves and axillary corymbs; and, 2. The officinalis, or coloured Peruvian bark, with elliptic leaves downy underneath, and the leaves of the corolla woolly. Both species are natives of Peru, where the trees attain the height of fifteen or twenty feet. The former particularly abounds in the hilly parts of Quito, growing promiscuously in the forests, and is spontaneously propagated from its seed. Both sorts have also been found in the province of Santa Fe. See Pl. XX.

The bark has an odour, to many people not unpleasant, and very perceptible in water distilled from it, in which floating globules, like essential oil, have been observed. Its taste is bitter and astringent, accompanied with a degree of pungency, and leaving a pretty lasting impression on the palate.

Some authors allege, that the Peruvians learned the use of this bark by observing certain animals affected with intermittents instinctively led to eat it; while others say, that a Peruvian, having an ague, was cured by happening to drink of a pool which, from some trees having fallen into it, was impregnated with cinchona; and its being employed in gangrene, is said to have originated from its curing it in a patient affected with an ague. About the year 1640, the lady of the Spanish viceroy, the Comitissa del Cinchon, was cured by the bark; which has therefore been called, *Cortex* or *Pulvis Comitissæ*, *Cinchona*, *Chinachina*, or *Chinchina*, *Kinakina*, or *Kinkina*, *Quinaquina* or *Quinquina*; and, from the interest which the Cardinal de Lugo and the Jesuit fathers took in its distribution, it has been called, *Cortex* or *Pulvis Cardinalis de Lugo*, *Jesuiticus*, *Patrum*, &c.

When it was first brought into Europe, it was reprobated by many eminent physicians; and at different periods long after, it was considered a dangerous remedy; but its character, in process of time, became very universally established. For a number of years, the bark which is rolled up into short thick quills, with a rough coat, and a bright cinnamon colour in the inside, which broke brittle, and was sound, had an aromatic flavour, a bitterish astringent taste, with a degree of aromatic warmth, was esteemed the best: though some esteemed the large pieces as of equal goodness. During the time of a former war, in the year 1779, the Hussar frigate took a Spanish ship, laden principally with Peruvian bark, which was much larger, thicker, and of a deeper reddish colour, than the bark in common use. Soon after it was brought to London, it was tried in St. Bartholomew's Hospital, and in other hospitals in the metropolis, and was said to be more efficacious than the quill bark. This put practitioners on examining into the history of the bark, on trying experiments with it, and on making comparative trials of its effects with those of the bark in common use, on patients labouring under intermitting complaints. In 1782, there was published an account of this red bark; in which the author says, that the small quill bark used in England, is either the bark of young trees, or of the twigs or branches of the old ones; and that the *red bark*, from the deep colour, is the bark of the trunk of the old trees; and he mentions a Mr. Arnot, who himself gathered the bark from the trees in Peru; and Mons. Condamine, who gives an account of the trees in the Memoirs of the Academy of Sciences at Paris in the year 1738. These both say, that taking the bark from an old tree effectually kills it; but that most of the young trees which are barked, recover, and continue healthy; and that for these reasons the Spaniards now barked the younger trees for foreign markets, though they still imported into Spain some of the bark of the old trees, which they esteemed to be much more efficacious than what was got from the young. From these facts it is inferred, that the large red bark brought to London in the year 1779 was of the same kind as that used by Sydenham and Morton, as it answers to the description of the bark used in their time, which is given by Dale and other writers on the materia medica, who were their contemporaries. On the whole, it is asserted, that the bark in question is not only stronger and more resinous, but likewise more efficacious and certain in its effect, than the common bark, and that it cured many agues after the other had failed.

Another species of cinchona has also been discovered in the West India islands, particularly in Jamaica, which is accurately described by Dr. Wright, under the title of *Cinchona Caribæa*, in a paper published in the Philosophical Transactions. In Jamaica, it is called the *sea-side beech*, and grows from twenty to forty feet high. The white, furrowed, thick outer bark is not used; the dark-brown inner bark has the common flavour, with a mixed kind of sweetish taste, at first like horse-radish and ginger, but becoming at last nauseously bitter and astringent. It is brought to us in pieces of a span length, rolled together, and a line, or half a line, in thickness; of a brown colour, and very fibrous in its fracture. It seems to give out more extract than the cinchona officinalis. Some of it was imported from St. Lucia, in consequence of its having been used with advantage in the army and navy during the American war. The fresh bark is found to be considerably emetic and cathartic, which objectionable properties it is said to lose on being dried.

The pale and the red barks are chiefly in use in Britain, though, in addition to these, another species has lately been introduced, called *yellow* bark,

the virtues of which have been described in a treatise by Dr. Relph. The common pale bark is brought to us in pieces of different sizes, either flat or quilled, and the powder is rather of a lighter colour than that of cinnamon. The red is generally in much larger, thicker, flattish pieces, but sometimes also in the form of quills, and its powder is reddish like that of Armenian bole. As already observed, it is much more resinous, and possesses the sensible qualities of the cinchona in a much higher degree than the other sorts; and the more nearly the other kinds resemble the red bark, the better they are now considered. The red bark is heavy, firm, sound, and dry; friable between the teeth; does not separate into fibres; and breaks, not shivery, but short, close, and smooth. It has three layers: the outer is thin, rugged, of a reddish brown colour, but frequently covered with mossy matter: the middle is thicker, more compact, darker coloured, very resinous, brittle, and yields first to the pestle: the inmost is more woody, fibrous, and of a brighter red.

All the barks yield their virtues both to cold and boiling water; but the decoctions are thicker, give out the taste more readily, and form an ink with a chalybeate more suddenly than the fresh cold infusions. The infusion, however, contains at least as much extractive matter, but more in a state of solution; and its colour, on standing some time with the chalybeate, becomes darker, while that of the decoction becomes more faint. When they are of a certain age, the addition of a chalybeate renders them green; and, when this is the case, they are found to be in a state of fermentation, and effete. Mild or caustic alkalies, or lime, precipitate the extractive matter, which in the case of the caustic alkali is redissolved by a farther addition of the alkali. Lime-water precipitates less from a fresh infusion than from a fresh decoction; and, in the precipitate of this last, some mild earth is perceptible. The infusion is by age reduced to the same state with the fresh decoction, and then they deposit nearly an equal quantity of mild earth and extractive matter; so that lime-water, as well as chalybeate, may be used as a test of the relative strength and perishable nature of the different preparations, and of different barks. Accordingly, cold infusions are found by experiment to be less perishable than decoctions; infusions and decoctions of the red bark than those of the pale: those of the red bark, however, are found, by length of time, to separate more mild earth with the lime-water, and more extractive matter. Lime-water, as precipitating this matter, appears an equally improper menstruum.

Water is found to suspend the resin by means of much less gum than has been supposed. Rectified spirit of wine extracts a bitterness, but no astringency, from a residuum of twenty effusions of cold water; and water extracts astringency, but no bitterness, from the residuum of as many effusions of rectified spirit. The residua in both are insipid.

From many ingenious experiments made on the Peruvian bark by Dr. Irvine, the power of different menstrua, acting upon that substance, was ascertained with greater accuracy than had before been done; and it appears, that, with respect to comparative power, the fluids after mentioned act in the order in which they are placed. 1. Æthereal spirit of vitriol.—2. Caustic ley.—3. French brandy.—4. Rhenish wine.—5. Soft water.—6. Vinegar and water.—7. Æthereal spirit of nitre.—8. Mild volatile alkali.—9. Rectified spirit of wine.—10. Mild vegetable alkali.—11. Lime-water. The antiseptic powers of vinegar and bark united, are double the sum of those taken separately. The astringent power of the bark is increased by acid of vitriol; the bitter taste is destroyed by it.

The officinal preparations of the bark are thus described by Dr. A. Duncan, in the Edinburgh new Dispensatory: it is given,

1. *In substance.*—The best form of exhibiting it is in the state of a very fine powder, in doses of from ten grains to two drachms and upwards. As it cannot be swallowed in the form of a dry powder, it must either be diffused in some liquid, as water, wine, or milk; or mixed with some viscid substance, as mucilage, syrup, or jelly. Its taste, which is disagreeable to many people, is best covered by milk, and it should, in all such instances, be taken immediately after it is mixed up; for, by standing any time, its natural flavour is communicated to the vehicle. But a much more important objection to giving Peruvian bark in substance is, that some stomachs will not bear it, from the oppression, and even vomiting, which it may excite. But we must endeavour to obviate this inconvenience by the addition of some aromatic, and by giving it in small doses more frequently repeated. If we are unable to succeed by these means, we must extract the most active constituents of the bark by means of some menstruum. It has therefore long been a pharmaceutical problem to discover which menstruum extracts the virtues of Peruvian bark most completely.

2. *Infusion.*—To those whose stomachs will not bear the powder, this is the best form of exhibiting Peruvian bark. Water, at a given temperature, seems capable of dissolving only a certain quantity, and therefore we are not able to increase the strength of an infusion, either by employing a larger quantity of the bark, or allowing them to remain longer in contact. One part of bark is sufficient to saturate sixteen of water in the course of an hour or two. To accelerate the action of the water, it is usual to pour it boiling hot upon the bark, to cover it up, and to allow it to cool slowly. After standing a sufficient length of time, the infu-

sion is decanted off for use. The infusion in water is however liable to one very great objection, that it cannot be kept even a very short time without being decomposed and spoiled. Therefore, in some instances, we prepare the infusion with wine; and it fortunately happens, that very often the use of the menstruum is as much indicated as that of the solvend. The colleges direct the following:

Infusum Cinchonæ Officinalis. Edin.

Take of Cinchona bark in powder, one ounce;
Water, one pound.
Macerate for twenty-four hours, and filter.

Infusum Corticis Peruviani. Dubl.

Take of Peruvian bark, in coarse powder, one ounce;
Mucilage of gum-arabic, two ounces;
Water, twelve ounces.
Triturate the bark with the mucilage, and add the water during the trituration. Macerate for twenty-four hours, and decant the pure liquor.

This Dr. A. Duncan recommends as a very elegant form of exhibiting the active principles of cinchona, and says, it will very well suit weak and delicate stomachs. The trituration promotes the solution, and the addition of the mucilage suspends the finest particles of the bark itself. The residuum of the cold infusion may be afterwards employed in making other preparations, especially the extract.

3. *Tincture.*—The great activity of the menstruum in this preparation, prevents the bark from being given in sufficiently large doses to exert its peculiar virtues. It is, however, a powerful stimulant. The Colleges direct a simple and a compound tincture: the latter usually known as *Huxham's tincture of bark.*

Tinctura Cinchonæ Officinalis. Edin. Lond. Dubl.

Take of Cinchona bark, four ounces, (six ounces, *Lond.*)
Proof spirit, two pounds and a half, (two pounds, *Dubl.* two pints, *Lond.*)
Digest for seven or eight days, and strain.

Tinctura Cinchonæ Composita. Lond. Dubl.

Take of Cinchona bark, in powder, two ounces;
Exterior peel of Seville oranges, dried, one ounce and a half, (half an ounce, *Dubl.*)
Virginian snake root, bruised, three drachms;
Saffron, one drachm;
(Cochineal, powdered, two scruples, *Lond.*)
Proof spirit, twenty ounces, (two pounds, *Dubl.*)
Digest for fourteen days, and strain the tincture.

The London College also direct an *ammoniated tincture of cinchona*, which is made by digesting four ounces of the bark in a quart of compound spirit of ammonia.

4. *Decoction.*—Water of the temperature of 212° is capable of dissolving a much larger proportion of the soluble parts of Peruvian bark than water at sixty. But the solvent powers even of boiling water have their limits, and by protracting the decoction we do not increase its strength, but rather, by diminishing the quantity of the menstruum, we lessen the quantity of matter dissolved. Besides, at a boiling temperature, some of the active constituent absorbs oxygen rapidly from the atmosphere, and is converted into what seems to be an insoluble and inert resinous substance.

Decoctum Cinchonæ Officinalis. Edin.

Take of Cinchona bark, in powder, one ounce;
Water, a pound and a half (distilled, nineteen ounces, *Lond.*).
Boil for ten minutes, in a covered vessel, and strain the liquor while hot.

The Dublin College direct six drachms of the bark, coarsely powdered, to eighteen ounces of water.

5. *Extract.*—In this preparation we expect to possess the virtues of Peruvian bark in a very concentrated state. The principal objections to its use are its great expence, and the decomposition and destruction of the active constituents of the bark during the preparation, when not properly conducted. It is convenient for the formation of pills and boluses, but we would always prefer a fresh infusion or decoction to any mixture in which the extract is redissolved.

Extractum Cinchonæ. Lond. Dubl.

Take of Cinchona bark, in coarse powder, one pound;
Distilled water, twelve pints.
Boil for an hour or two, and pour off the liquor, which, while hot, will be red and pellucid, but, as it grows cold, will become yellow and turbid. The same quantity of water being again poured on, boil the bark as before, and repeat the boiling until the liquor, on becoming cold, remains clear. Then reduce all these liquors, mixed together and strained, to a proper thickness, by evaporation.

This extract is prepared under two forms; one

soft, and fit for making pills; the other *hard* and pulverizable.

Extractum Cinchonæ Officinalis. Edin.

Take of Cinchona bark, in powder, one pound;
Alcohol, four pounds.
Digest for four days, and pour off the tincture.
Boil the residuum in five pounds of distilled water for fifteen minutes, and filter the decoction, boiling hot, through linen. Repeat this decoction and filtration with an equal quantity of distilled water, and reduce the liquor by evaporation to the consistence of thin honey. Draw off the alcohol from the tincture by distillation, until it also become thick; then mix the liquors, thus inspissated, and evaporate them in a bath of boiling water, saturated with muriate of soda, to a proper consistency.

In the form of clyster, bark may be given in substance, decoction, or extract. The powder is used as a tooth-powder for spongy and bleeding gums, and the decoction is an excellent astringent gargle or wash in the ulcerated sore throat.

Practitioners have differed much with regard to the mode of operation of the Peruvian bark. Some have ascribed its virtues entirely to a stimulant power. But while the strongest and most permanent stimuli have by no means the same effect with bark in the cure of diseases, the bark itself shows hardly any stimulant power, either from its action on the stomach, or on other sensible parts to which it is applied. From its action on dead animal fibres, there can be no doubt of its being a powerful astringent; and from its good effects in certain cases of disease, there is reason to presume that it is a still more powerful tonic. To this tonic power, some think, that its action as an antiseptic is to be entirely attributed; but that, independently of this, it has a very powerful effect in resisting the septic process to which animal substances are naturally subjected, appears beyond all dispute, from its effects in resisting putrefaction, not only in dead animal solids, but even in animal fluids, when entirely detached from the living subject.

But although it be admitted that the Peruvian bark acts powerfully as an astringent, as a tonic, and as an antiseptic; yet these principles will by no means explain all the effects derived from it in the cure of diseases. And accordingly, from no artificial composition in which these powers are combined, or in which they exist even to a higher degree, can the good consequences resulting from Peruvian bark be obtained. Many practitioners, therefore, are disposed to view it as a specific. If by a specific we mean an infallible remedy, it cannot indeed be considered as intitled to that appellation; but in as far as it is a very powerful remedy, of the operation of which no satisfactory explanation has yet been given, it may with great propriety be denominated a specific. But whatever its mode of operation may be, there can be no doubt that it is daily employed with success in a great variety of different diseases, insomuch that physicians would be greatly at a loss were they deprived of this remedy.

It was first introduced, as has already been said, for the cure of intermittent fevers; and in these, when properly exhibited, it rarely fails of success. Practitioners, however, have differed with regard to the best mode of exhibition; some prefer giving it just before the fit, some during the fit, others immediately after it. Some, again, order it in the quantity of an ounce between the fits, the dose being the more frequent and larger according to the frequency of the fits; and this mode of exhibition, although it may perhaps sometimes lead to the employment of more bark than is necessary, we consider as upon the whole preferable, from being well suited to most stomachs. The requisite quantity is very different in different cases; and in many vernal intermittents, it seems even hardly necessary to administer it at all.

It is liable, when given in large doses, to vomit or purge, and sometimes it oppresses the stomach. These, or any other effects that may take place, are to be counteracted by remedies particularly appropriated to them. Thus vomiting is often restrained by exhibiting it in wine; looseness, by combining it with opium; and sickness at the stomach, by the addition of an aromatic. But, unless for obviating particular inconveniences, it is more successful when exhibited in its simple state than with any addition; and there seems to be little ground for believing that its powers are increased by crude sal-ammoniac, or any other additions whatever.

In agues it is now given from the very commencement of the disease, and without previous evacuations, though some choose to premise an emetic. It is to be continued not only till the paroxysms cease, but till the natural appetite and strength return. Its use is then to be gradually left off, and repeated at proper intervals to prevent a relapse; to which, however unaccountable, independently of the recovery of vigour, there often seems to be a peculiar disposition.

Bark is a medicine which seems not only suited to the cure of intermittents, but to that state of fibre, on which, however difficult to explain, all rigidly periodical diseases seem to depend. Nor is its use of less importance in continued fevers; attention being paid to keep the bowels in a proper state, and to promote, when necessary, the evacuation of redundant bile. In the confluent small-pox, it promotes a proper suppuration in the pustules, diminishes the fever through its whole course, and

corrects putrescence and the disposition to gangrene. In ulcerated sore throats it is used with extraordinary success, as it is also, externally and internally, in every species of gangrene. In all those hæmorrhages called *passive*, and which it is allowed all hæmorrhages are very apt to become, and likewise in other increased discharges which tend to debilitate the patient, it is much employed; and in certain undefined cases of hæmoptysis, some allege that it is remarkably effectual when joined with some of the mineral acids. Lastly, it is used for obviating the disposition to nervous and convulsive diseases, as it greatly lessens the irritability of the system; and some have great confidence in it, joined with the acid of vitriol, in cases of phthisis, scrophula, ill-conditioned ulcers, rickets, scurvy, and in promoting the recovery of convalescents.

Dr. Cullen, after declaring this to be "one of the most considerable articles of the Materia Medica," says, he considers:

1. That it is a bitter and astringent conjoined, and therefore a powerful tonic; and that its properties as an aromatic are inconsiderable.

2. That the action of these powers on the human stomach, sufficiently accounts for its good effects in fevers, particularly of the intermittent kind.

3. That, for the most part, it may be exhibited in the latter, without waiting for a repetition of the paroxysms.

4. That, the natural functions being healthy, no preparation for its exhibition is necessary; though the premising of an emetic, may excite activity in the stomach, and enable it to dispense with a larger quantity of the bark. A suspected redundancy of bile, may also require intestinal evacuation.

5. That, if the paroxysms of an intermittent seem to be anticipating their periods, and especially if these increase in their duration, their course should always be stopped by an immediate use of the bark. Marks of internal inflammation, and of a general inflammatory diathesis, form exceptions to this; for, till their removal, this remedy is found to be ineffectual.

6. That, in cases even of visceral affection, the bark is not always to be withheld; since the accumulations of blood in the liver and spleen are increased by every repetition of the cold stage of an intermittent.

7. That, from the nicest observation as to the moment when bark may be most advantageously given in an intermittent, it appears, "that the giving a large dose *immediately before the time of accession*, is the most proper practice;" but as some stomachs will not bear the necessary dose (ʒij of the pale kind), smaller quantities may be repeated "every hour, for some hours, near to the time of accession."

8. In remittent fevers, although no positive interdiction should be given to the use of the bark during their exacubations, the time of remission is to be especially chosen.

9. When either of these fevers puts on a continued form, it will require the bark, as in cases of indistinct remission.

10. This remedy, improper in all cases when the phlogistic diathesis is present, is particularly so in the beginning of acute rheumatism.

11. In typhous fevers, where combined with the phlogistic diathesis, as is especially the case in their commencement, the bark is improper; as aggravating the inflammatory state, and occasioning local and fatal inflammations of the brain and lungs. Cases where there is little if any inflammatory diathesis (which are very rare), may, accidentally, occur as exceptions.

12. In epidemic fevers, attended with phrenitic symptoms, this remedy is inadmissible.

13. In the exanthematic affections, small-pox, measles, erysipelas, &c. it may be required to correct the "putrid diathesis," but in that case only is it proper.

14. In scarlatina and cynanche maligna the exhibition of the bark is indisputable; except in some *peculiar cases* of both, which are only to be distinguished by the practitioner's ingenuity.

Dr. Cullen's ideas concerning the use of cinchona in catarrhal affections, hæmorrhagy, phthisis, gangrene, and in diseases arising from a laxity of the system, may be seen at large in Vol. II. of his "Lectures on the Materia Medica."

CI'NCHONA ANGUSTIFO'LIA; the systematic name of the narrow leaved Peruvian bark tree. See CINCHONA.

CI'NCHONA CARIBÆ'A; the systematic name of the Caribæan bark tree. See CINCHONA, and Pl. XX.

CI'NCHONA CORTEX PERUVIANUS RUBER, or *Chinchina rubra*. The medicinal qualities of this red bark are similar to those of the former. See CINCHONA.

CI'NCHONA CORTEX PERUVIANUS-FLAVUS; *Cortex chinæ flavus*, or *Cortex chinæ regius*. The medicinal properties of this new species are also nearly the same as those of the cinchona officinalis. See CINCHONA.

CI'NCHONA FLORIBU'NDA; the systematic name of the plant which affords the Saint Lucia bark. See CHINCHINA SANCTÆ LUCIÆ.

CI'NCHONA OFFICINA'LIS; the systematic name of the Peruvian bark-tree. See CINCHONA.

CI'NCHONIN, a name given, by Dr. Andrew Duncan, to the principle which forms the precipitate with tannin. This was found to be soluble in alcohol; and as, in its properties, it did not coincide with any other which had before been described, it certainly is very properly considered as a distinct substance, not before recognised in chemical language. The active constituents of Peruvian bark,

according to the latest analysis, are, cinchonin, tannin, and gallic acid, combined with some mucilage and resin. See CINCHONA.

CINCI'NNUS, the hair which grows on the temples. See CAPILLUS.

CINCLE'SIS, (from κιγκλιζω, *to shake* or *wag*), in Vogel's Nosology; a morbid nictitation, or involuntary winking.

CINERA'RIA, RAGWORT; a genus in Linnæus's botany. He enumerates twenty-six species. It is also the name of the stœbe-leaved KNAPWEED, a species of CENTAUREA.

CINERA'RIUM, the ash-hole of a furnace.

CI'NERES CLAVELLA'TI, (*clavellatus;* from *clavus*, a wedge); *kali impurum* or impure pot-ash. Alkali, in this state, is called, in the new chemical nomenclature, *carbonas potassæ alkalescens.* It is from this salt the various preparations of kali are made; as the *sal alkalinus fixus vegetabilis purificatus*, the *kali præparatum*, the *aqua kali*, the *lixivium causticum*, the *kali purum*, *&c.* The name of *cineres clavellati* originated from the little wedges or billets into which the wood was usually cut to make pot-ash.

CI'NERES RU'SSICI; the Russian pot-ash in its impure state.

CINERITIOUS, (from *cinis*, ashes), of the colour of ashes; an epithet applied to the cortical substance of the brain, from its resemblance to the colour of burnt ashes.

CINNA'BARIS, (κιννάβαρις), CINNABAR; a red mineral substance consisting of mercury combined with sulphur. It is either native or factitious. The *native* is an ore of quicksilver, moderately compact, very heavy, and of an elegant striated red colour. This kind of Cinnabar is found in the Dutchy of Deuxponts, in the Palatinate, in Spain, South America, &c. It is called native vermillion, and cinnabar in flowers. Artificial cinnabar, employed as a *factitious* cinnabar, is a mixture of mercury and sulphur sublimed, and thus reduced to a fine red substance. The best is of a high colour, and full of needle-like spiculæ. See HYDRARGYRUS SULPHURATUS RUBER. Cinnabar is often employed as a mild mercurial, and as an alterative. Hoffman greatly recommends it as a sedative and antispasmodic; and Stahl makes it an ingredient in his "*Temperant Powder.*" Other intelligent physicians deny that cinnabar, taken internally, has any medicinal quality; and their opinion is grounded on the insolubility of it in any menstruum. This question, concerning its utility as an internal medicine, cannot be decided without further researches.

CI'NNABAR FACTI'TIA; factitious cinnabar. See HYDRARGYRUS SULPHURATUS RUBER.

CI'NNABAR NATI'VA; native cinnabar. See CINNABARIS.

CINNAMO'MUM, (κιννάμωμον; from *kinamom*, Arab.); CINNAMON. The tree which affords the true cinnamon, which is its inner bark, is the *laurus cinnamomum* of Jacquin, a native of Ceylon. *Laurus foliis trinerviis ovato-oblongis; nervis versus apicem evanescentibus*, Linn. Class, *Enneandria.* Order, *Monogynia.* Cinnamon bark is one of the most grateful of the aromatics; of a very fragrant smell, and of a moderately pungent, glowing, but not fiery taste, accompanied with considerable sweetness, and some degree of astringency.

The best cinnamon is rather pliable, and ought not much to exceed stout writing paper in thickness. The inferior kind is distinguished by being thicker, of a darker and brownish colour, hot, and pungent when chewed, and succeeded by a disagreeable bitter after-taste. The Dutch have been accused of deteriorating this article, by mixing it with a proportion of real cinnamon, but which had been deprived of its essential oil by distillation. This fraud could only be detected by the weaker smell and taste. It is also often mixed with cassia bark. This last is easily distinguished by its breaking over smooth, and by its slimy mucilaginous taste, without any thing of the roughness of the true cinnamon bark.

According to Dr. A. Duncan, this substance, when distilled with water, furnishes a small quantity of very pungent and fragrant oil; and the water itself has a strong flavour of cinnamon. The watery extract in Neumann's experiment amounted to 720 from 7680 parts. With alkohol the oil does not pass over in distillation, but remains in the extract, which amounts to 960. This essential oil, which is imported from Ceylon, is of a whitish yellow colour, and has a pungent burning taste. It should sink in water, and be entirely soluble it alkohol.

Of this bark, Dr. Cullen says, "its oil is sufficiently acrid; but not being in large proportion in the substance of the cinnamon as nature produces it, this may be employed more safely than most of the other aromatics. As it is a bark, its aromatic qualities are accompanied with somewhat astringent, which may determine its being employed in certain cases rather than some of the other aromatics; but the astringent quality is not considerable, and can never be trusted to by itself. Its aromatic qualities are extracted by water in infusion, but more powerfully by it in distillation; and in both ways also by a proof-spirit applied: hence both the British dispensatories have now also ordered a tincture of it made with proof-spirit. In all these ways it may be agreeably employed; but we should never lose sight of its being stimulant and heating, for even the simple distilled water, when frequently employed, has proved hurtfully irritating to the fauces."

Besides forming an ingredient in many officinal compositions in which it is only an auxiliary, the colleges direct a distilled water and spirit of cinna-

mon, and a tincture in which three ounces of this bark are infused for a week in proof-spirit.

CINQUEFOIL. See PENTAPHYLLUM.

CIRCÆ'A, (from *Circe*, the famous inchantress), ENCHANTER'S NIGHT-SHADE; a genus in Linnæus's botany. He enumerates two species and one variety.

CIRCOCE'LE, (κιρσοκηλη; from κιρσος, *varix*, or a dilatation of a vein, and κηλη, *a tumor*); a *variocele*, or enlargement of the veins of the spermatic cord, extending from the abdominal ring to the superior part of the scrotum. It is produced by a varicose state of the spermatic vein. See VARICOCELE. Both this and the varicocele are occasionally produced by obstruction in the veins; though most frequently owing to a relaxed state of these vessels; to which we may add, that on account of the smallness of the corresponding artery, they are not sufficiently affected by its influence. The tumor produced by these causes, is sometimes so large as to appear like a hernia or hydrocele; but we distinguish it from these by the touch, for varicose veins are like worms filled with elastic matter. We have another mark upon which we can still more depend: the tumor in the erect posture of the body is much increased, while, in the horizontal situation, it almost entirely disappears. The treatment is the same as in the varicocele.

CI'RCON, a peculiar species of earth, discovered in the jargon of Ceylon; which last is also called *circon.*

CIRCULATION, the round, or course, which the blood takes, when impelled by the organs destined by nature for that end. The heart, by the alternate systole and diastole of its ventricles and auricles, pushes the blood through the arteries to all the parts of the body, and receives it again from the veins.

The *circulation of the blood*, is carried on in three different manners. 1. The first and most universal kind of circulation is that by which almost all the arteries of the body are filled by the systole of the heart, and the greatest part of the veins evacuated by the diastole. See HEART. 2. The second kind of circulation, opposite to the first, is through the coronary vessels of the heart, the arteries of which are filled with blood during the diastole of the ventricles, and the veins emptied during the systole. 3. The third kind of circulation is that of the left ventricle of the heart; through the venal ducts of which, a small quantity of blood passes, without going through the lungs, which is the course of all the remaining mass of blood. Besides these three different kinds of circulation, there are some peculiarities in the course of the blood, which may be looked upon as particular circulations. Such is the passage of the blood through the liver, through the corpora cavernosa of the penis, and through the cavernous sinuses of the dura mater.

The blood of the two venæ cavæ is propelled by a muscular force, in either vein, into the right auricle. These veins, while they lie within the thorax, are endowed with strong and irritable muscular fibres, by whose contraction the blood is driven into the neighbouring auricle. See CAVA. In like manner, the auricle, being irritated, is contracted on all sides. First, by a constriction of its muscular fibres, the anterior semicylinder of the auricle is reduced to a plane; while the same fibres, by their contraction, bring back the middle arch towards the anterior extremity or beginning of the heart, and likewise towards its posterior extremity or sinus; afterwards the appendix of the auricle descends, and is contracted transversely, while the lower part ascends; and thus the auricle becomes shorter: And, lastly, the left edge turns evidently to the right, and the right edge a little to the left; and thus the auricle is rendered narrower. The blood of both cavæ must necessarily, therefore, be driven through the open valves of the right ventricle of the heart: because the blood is hindered from returning again into the lower cava, by the contraction of the auricle, by the resistance of the succeeding blood from the abdomen, and by means of the *Eustachian valve;* and is hindered from ascending, both by the motion and weight of the consequent blood. It is driven back, however, on both sides, if there happens to be any obstacle in the lungs.

The use of the *valvulæ tricuspides* is sufficiently evident; for the right auricle being contracted, the blood is forced through the auricular orifice, and, like a wedge, separates the pendulous portions of the valves, and presses them to the sides of the heart; while the uppermost valve shuts the pulmonary artery, lest the blood, by the weak impulse of the auricle, should flow into that artery: the blood thus received, and confined within the right ventricle of the heart, is, by its strong contraction, powerfully expelled into the artery.

The sensible fibres of the heart, being irritated by the quantity and weight of this warm blood, is thereby solicited to a contraction: for the fibres of the heart, like other muscles, are furnished with nerves of various origin, and in great abundance. That these nerves conduce powerfully to move the heart is highly probable, from a consideration of the common nature of muscles; from the increase which follows in the heart's motion by irritating the eighth pair of nerves, either at the brain or the medulla spinalis; and from the languor that ensues upon tying these nerves, which proves fatal, either suddenly or within a few days, even though the ligature be made only on a few of them; for the intercostal, and especially those from the ganglion of the upper thoracic, cannot be tied.

But that there are still other causes, besides that of the nerves, conducing to the motion of the heart,

we are persuaded from observing its motion undisturbed by the irritation of all the nerves in the living animal; from its remaining after the greatest wounds of the head, and even of the cerebellum and medulla spinalis; likewise, from its motion when torn out of the breast; chiefly in those animals whose lungs, being impermeable, make no resistance to the heart's motion; for the motion of the heart is observed to be very vigorons in the fœtus, before the brain is well formed, and likewise in animals wanting the head. And all our experiments agree in this, that the quiescent heart in dead or dying animals, when irritated by heat, vapours, poisons, and especially impelled flatus, watery liquors, wax, or blood, or on receiving an electric spark, immediately contracts itself, putting all its fibres into a rapid motion, by a force sometimes common to the whole heart, and sometimes affecting only a particular part of it.

It is, therefore, evident, that the stimulus occasioned by the venous blood driven into the heart, causes it to contract. This contraction is convulsive, made with great celerity, and a manifest corrugation of the fibres. The whole heart, in the contraction, becomes shorter, thicker, and harder, so that the left ventricle is drawn somewhat towards the septum of the heart, and the right one much more. The base also advances towards the apex; but the apex more evidently towards the basis. Even the septum of the heart is rendered shorter, and draws itself towards the basis. By this action, the fleshy parts of the heart swell inwardly, and compress the blood. Of this fact we may be convinced, by thrusting a finger into the ventricle of the heart in an animal newly killed. That the heart is accurately enough emptied in this action, appears from the event; from the evident paleness of animals whose heart is white, as frogs and chickens; and from the internal surface being full of eminences, which exactly answer to opposite cavities, and to the thick reticular arms or columns interrupted by sinuses. The apex of the heart, being contracted a little like a hook, strikes against that part of the pericardium next the thorax. Forwards, there is also a pulsation from the left venal sinus, which is at that time filled. In expiration, the heart strikes violently upwards and forwards. The truth of both these we know by experiment.

The blood, which is pressed by the contracted heart, endeavours to escape in all directions; it is driven from the muscular sides, towards the axis of the ventricle, and that part of it which is contained between the sides of the ventricle and the annulus of the auricular orifice, pushes the annulus within the auricle, and by this action upon the whole circumference of the annulus, it becomes extended. A small quantity of blood is indeed returned into the auricle before the pressure becomes sufficient to close the tricuspid valves. When these valves are shut, the violent pressure of the blood against them might considerably injure them, or even push them back into the auricle; but to prevent any accident of that kind, their muscular columns, which contract with the heart, keep their edges firmly united.

The blood being impelled from the sides toward the axis of the contracting heart, endeavours to escape in that direction, and, by rushing like a wedge between the valves, presses their loose edges against the sides of the pulmonary artery, so as to run freely out of the heart. The truth of this appears from the fabric of the parts, from injections, and from ligatures, which, by obstructing the lungs, will not suffer the cavities in the right side of the heart to be emptied.

The blood now received into the pulmonary artery, circulates through the lungs. That the blood goes directly from the arteries into the pulmonary veins, appears evidently from their structure; from a ligature, which, confining the blood between the heart and lungs, causes an aneurismal dilatation of the artery: from polypuses, by which the mouth of the pulmonary artery being obstructed, the right cavities of the heart become enlarged, and at length burst, while the left remain empty; from injections, for water, isinglass, and milk, are very easily forced from the pulmonary artery into the vein, and from thence into the left cavity of the heart. And lastly, the direct anastomoses, or final openings of the arteries into the veins in the lungs, may be seen by microscopes, in frogs, &c.

The blood which has once entered the pulmonary artery cannot return to the heart; because its valves are of such dimensions, that when distended, they perfectly shut up the opening at the heart; and they are so strong that they resist a much greater force than the contraction of the pulmonary artery. Sometimes, however, from a greater contractile force of the artery, they grow somewhat callous; or, from a laceration of their outer membrane, a bony matter is poured in between the duplicature of the valves. When the blood, by the contraction of the artery, returns towards the heart, it meets and enters the open concavities of the valves, which are by that means expanded, and the mouth of the artery is completely shut. Any opening that might be left, is precluded by the small callous bodies in the middle of the valves.

The *pulmonary veins* (of which we shall say more under its proper head), run into larger branches, which at last terminate in four (seldom two, and still more rarely five) trunks; to which it has been customary to affix a name in the singular, by calling them the *pulmonary vein*. These enter the cavity of the pericardium, from whence they receive an external covering, and are then inserted into the corners of the left or posterior sinus, which is sometimes likewise called the *pulmonary sinus*. In this course the upper veins descend, and the

lower ones ascend. That these veins bring their blood towards the heart, in the same direction with the sinus into which they open, is proved by a ligature, which causes a turgescence or swelling, from the blood being retained, between the ligature and the lungs.

In this left sinus the blood waits for the heart's relaxation, when it is driven into the left ventricle, in the same manner as the right auricle impelled its blood into the right ventricle.

From what has been said, then, it appears that the same blood is now arrived into the left ventricle of the heart, which was a little before sent from the venæ cavæ into the right auricle. This course of the blood, from one side of the heart to the other, through the lungs, is called the *pulmonary* or *lesser circulation*, and was known to many of the ancients. It is proved by the increased bulk of the pulmonary veins on the left side, and likewise of the right cavities of the heart, from the entrance into the left ventricle being obstructed.

The *left*, or posterior and upper *ventricle* of the heart, which is always first formed, and in a great number of animals is the only one, makes that part of the heart which Dr. Monro calls its convex superior side. It is somewhat narrower, a little longer, rounder, and generally of a less capacity, according to Haller, than the right ventricle; for its contents are about two ounces, while those of the right amount to three. Its internal fabric is reticular, but more nicely wrought than in the right ventricle, and within the mouth of the artery it is smooth; but its force is considerably greater, as the muscular flesh that surrounds it is much thicker, and almost three times as strong. The septum of the heart belongs mostly to the left, but some part of it also to the right ventricle: the whole of it is reticulated, but solid, and incapable of suffering any injected liquid to pass from one ventricle to another.

Again, this left ventricle being excited to motion by the impelled blood, from the same irritable nature already mentioned, contracts, and drives its contained blood with a violent motion in the direction of its axis, the tip or cone of the heart being at the same time drawn nearer to its basis. And since the apparatus of the mitral valves is here the same as in the tricuspids, the blood now expanding the ring from whence they arise, removes that valve which lay against the mouth of the aorta, and opens a way for itself to the artery. This is proved by ocular demonstration in living animals, where the left ventricle swells upon shutting the passage into the aorta.

The *semilunar valves of the aorta* differ little from those of the pulmonary artery: only, as the opening is here greater, so the valves are proportionally larger and stronger, and are not so often found to want those callous round bodies in the middle. The fibres, too, of the valves, both transverse and ascending, are here somewhat more conspicuous.

After the contraction of the heart follows its relaxation or *diastole*, in which it becomes empty, lax, and soft, recovers its former length, the ventricles recede from the septum, and the basis from the apex. But, while it is in this state, the blood in the auricles, having been, as it were, in a state of expectation, rushes through the openings of the valves of the veins, dilates the opposite sides of the heart, and increases all its dimensions. After the auricles have freed themselves of the blood they contained, they are in like manner relaxed, and their opposite sides remove from each other. The blood then collected in the venæ cavæ and pulmonary veins, fills the auricles by the contraction of the veins; renders them long, broad, and thick, like the ventricles; and even distends and fills the dentated processes of the crested margin.

These motions of the right and left auricle, with the right and left ventricle, are not performed in that succession in which, for the sake of method, Dr. Monro has described them; for both the auricles are contracted, while both the ventricles are relaxed; so that the contraction of the auricles precedes the contraction of the ventricles. This fact is ascertained by experiments on dying animals, and on animals with cold blood. Those who have inadvertently taught otherwise, have not taken the advantage of making a sufficient number of experiments on living animals. That the auricle, near death, makes frequent palpitations before the ventricle of the heart performs one contraction, is certainly true. The auricle, with its sinus, forms one cavity; and both are filled and both emptied in the same instant.

The velocity of the blood, at its entrance into the aorta, and the force with which it is expelled from the heart, have been subjects of much controversy; and different anatomists have computed them differently. If we would make a just estimate of the heart's force in living animals, we must consider what resistances that complex muscle overcomes: we must compute the enormous weight of the whole mass of blood; a mass perhaps of fifty pounds and upwards: for all the quantity of fluids, once stagnant in a person lately drowned or fainting away, are easily put into their former motion by the heart alone. We must also consider the great decrease of the blood's velocity, arising from the greater capacity of the dividing branches; and yet, even in the least vessels, its velocity is very considerable, as appears by the Sanctorian perspiration seen to fly rapidly off like smoke, and by the quick motion of the blood, seen by the help of microscopes, in fishes tails. Frictions in every machine always consume the greatest part of the moving forces; and these frictions will doubtless be very

large in the human body, whose blood and juices are extremely viscid, and whose vessels are so small as scarcely to allow more than a single globule to pass at a time, and even that not without changing its figure. All these resistances being considered, we may without doubt conclude, that the force of the heart must be extremely great, in order to preserve the motion so strong as we perceive it in the least arteries. Another argument of the heart's force is, that aneurisms and arteries are burst, and very great weights, as well as the body itself, raised by the force of the heart's systole.

The blood, being driven into the aorta, rushes first of all into the coronary arteries, by which the heart is supplied with blood. These arteries are for the most part two; the right goes off between the aorta and pulmonary artery, and the upper and left one betwcen the left auricle and the aorta. All the external arteries are surrounded with much fat; but their cavity is more intercepted with valves than that of other arteries. These arteries communicate, by inosculation of the small branches, every where about the septum and tip of the heart; but they no where make a complete ring round the heart. They terminate in a twofold manner; and the first termination of them is into the coronary veins, whose branches run in company with those of the arteries, but their trunks run in a different course.

Some authors suppose that the coronary arteries are filled with blood, not by the contracting of the heart, but of the aorta; and the arguments by which they support their hypotheses are, the retrograde angle at which the coronaries go off, the paleness of the contracted heart, and the valves of the aorta covering the mouths of the coronary arteries. But the two last of these arguments are contradicted by experience; and the first can only impede or lessen, and not intercept, the flux into the heart; for the injections of air or mercury into all the seminal and biliary vessels, demonstrate that the large retrograde angles, which the vessels often make there, do not hinder the fluids from taking their natural course, though they retard them. But a proof, still more evident, is, that the coronary artery beats at the same time with all the other arteries in the body, and the blood starting from it, makes a higher saltus at the time when the heart is contracting.

Dr. William Harvey was the first who discovered, or rather perfected the discovery of, the circulation of the blood. This great physiologist experimentally asserted the motion of the blood returning by the veins to the heart, in such a manner as to render the whole intelligible, and leave no room for doubt. The valves of the veins, indeed, lead us to this truth (see VEINS); for the common use or office of these valves is, to determine the pressure that is made from any quarter upon the veins, towards the heart, by allowing no opportunity to the venous blood that has once entered the trunk, to flow back to the branches. For, since the valves open upwards towards the heart, the blood enters and expands them; and those parts of the valves which project into the cavity of the vein, approach towards the axis, until the opposite sides, by meeting together, shut up the tube. This we know from inflations, ligatures, and injections of the veins; for we never can force a liquor easily into the veins by propelling it against their valves. They do not, indeed, every where shut up the whole cavity of the veins; but where they do not shut close, they always intercept the greatest part of the tube.

The circulation of the blood is therefore now received by every one as a medical truth; namely, that all the blood of the human body is carried through the aorta, from the left cavity of the heart, to the extreme parts or converging ends of the arterial branches; from whence the whole mass is again transmitted into the least veins, which convey it to the larger, and from them into the cava and heart itself; in which course it perpetually goes and returns during life.

Yet there are not wanting some instances where, by passions of the mind, by copious blood-letting, or convulsions, the blood has been forced to recede back from the smaller into the larger arteries; and, on the other side, where an obstruction has been formed above the valves, the blood has been known to slide back from the venous trunks into their smaller branches. But then these accidents are momentary and sudden; and the blood soon returns into its natural course. These things happen most frequently in the abdomen and vena portæ.

All the juices, therefore, in the human body, are driven out of the heart into the aorta; from whence they are all returned again to the heart by the veins; those humours only excepted, which are exhaled or discharged out of the body. To complete the round of the blood's circulation, it only remains for us to find out a course for the blood from the right to the left cavities of the heart. For this part of the subject, see the articles LUNGS and PULMONARY VESSELS.

CIRCULUS, in chemistry, an iron instrument in form of a ring, which being heated red-hot, and applied to the necks of retorts and other glass vessels till they grow hot, a few drops of cold water thrown upon them, or a cold blast, will make the necks fly regularly and evenly off. Another method of doing this, is, to tie a thread, first dipt in oil of turpentine, round the place where you would have it break; and then setting fire to the thread, and afterwards sprinkling the place with cold water, the glass will crack exactly where the thread was tied.

CI'RCULUS ARTERIO'SUS I'RIDIS. The artery which forms a circle round the iris is so termed.

CIRCUMCISION, (*circumcisio*, from *circumscido*, to cut about), the cutting off the prepuce from the glans penis; an ancient custom still practised amongst the Jews. This operation is found expedient in some cases of surgery; but it is too simple to require a description.

CIRCUMFLE'XUS; the muscle called *Circumflexus palati* by Albinus; the *Sphæno-salpingo-staphilinus; seu staphilinus externus* of Winslow; *Musculus tubæ novæ* of Valsalva; and *Palato-salpingeus* of Douglas. This muscle arises from the spinous process of the sphenoid bone, behind the foramen ovale, which transmits the third branch of the fifth pair of nerves; from the Eustachian tube, not far from its osseous part: it then runs down along the pterygoideus internus, passes over the hook of the internal plate of the pterygoid process by a round tendon, which soon spreads into a broad membrane. It is inserted into the velum pendulum palati, and the semilunar edge of the os palati, and extends as far as the suture which joins the two bones. Generally some of its posterior fibres join with the constrictor pharyngis superior, and palato-pharyngæus. Its use is to stretch the velum, to draw it downwards, and to a side towards the hook. It has little effect upon the tube, being chiefly connected to its osseous part,

CI'RRUS, or CIRRHUS, in botany, a clasper or TENDRIL; that fine spiral string or fibre put out from the foot-stalks, by which some plants, as the ivy and vine, fasten themselves to walls, pales, or trees, for support. The term is synonymous to the *capreolus*, *clavicula*, and *viticulus* of other botanists; and is ranked by Linnæus among the *fulcra*, or parts of plants that serve for protection, support, and defence. Tendrils are sometimes placed opposite to the leaves, as in the vine; sometimes at the side of the foot-stalk of the leaf, as in passion flowers; and sometimes, as in winged pea, *pisum ochrus*, they are emitted from the leaves themselves. With respect to composition, they are either simple, that is, composed of one fibre or chord, as in the vetch; or compound, that is, consisting of two, three, or more, as in the everlasting pea. *Bitter-sweet*, *solanum*, *dulcamara*, *bignonia*, and *ivy*, send forth tendrils which plant themselves like roots in the adjacent walls, or the bark of the neighbouring trees. Claspers, says the ingenious Dr. Grew, are like trunk-roots, a mean betwixt a root and a trunk, but a compound of both, as may be gathered from their circumvolutions, in which they mutually ascend and descend. In the mounting of the trunk, continues the same author, claspers serve for support. Thus, in vines, the branches being very long, fragile, and slender, would be liable to frequent breaking, unless, by means of their claspers, they were mutually contained together; so that the whole care is divided betwixt the gardener and nature: the former, with his ligaments of leather, secures the main branches; and nature, with those of her own providing, secures the less.

CIRSO'IDES; an epithet in Rufus Ephesius for the upper part of the brain. He also applies this name to two of the four seminal vessels.

CI'RSOS, (κιρσος), a varix. See VARIX.

CISSA'MPELOS, (κισσαμπελος: from κισσος, *ivy*, and αμπελος, *the vine)*; the wild vine, with leaves like the ivy. It is a genus in Linnæus's botany. He enumerates five species.

CISSA'MPELOS PAREIRA; the systematic name of the *pareira brava*. See PAREIRA BRAVA.

CISS'ANTHEMOS, a name in Dioscorides for one of the two species of CYCLAMEN.

CI'SSUS, wild grape; a genus in Linnæus's botany. He enumerates six species. The fruit of some of the species, is eaten by the negroes in the West Indies.

CIST, or XIST, a measure of wine containing about four pints.

CI'STUS, (κισσος); the *cistus* or ROCK-ROSE. Also a name for a species of CHAMÆCISTUS. *Cistus* is a genus of Linnæus's botany; including the *Helianthemum*, and about forty other species. Several species of the *Cistus* are called *Dwarf Cistuses*.

CI'STUS CRETICUS; the systematic name of the plant from which we obtain the ladanum of the shops. See LADANUM.

CITHAREXYLON, FIDDLE-WOOD tree; a genus in Linnæus's botany. He enumerates three species.

CITRA'GO. See MELISSA.

CI'TRA INDIS LIGNUM, a sort of reddish sweet-scented wood, of an aromatic taste, growing in the East Indies.

CITRA'RIA. See MELISSA.

CI'TRATS, or CITRATES, (from *citrus*, the citron); salts formed by the union of the acid of lemons with alkaline, earthy, or metallic bases; there are twenty-four species enumerated in M. Fourcroy's Elements of Natural History and Chemistry.

CI'TREA. See LIMON.

CITRIC ACID; the peculiar acid procured from lemons. It exists in a disengaged state in the juice of the fruit, and exhibits its acid properties without any preparation. This acid is nevertheless always mixed with a mucilaginous principle, capable of alteration by fermentation. Mr. Georgius, a Swedish chemist, has given a method of purifying this acid without changing its properties. He fills a bottle with lemon juice, closes it with a cork, and preserves it in a cellar. In this way the acid was preserved for four years, without corrupting. The mucilaginous parts had fallen

down in flocks; and a solid crust was formed beneath the cork, the acid itself having become as limpid as water. To dephlegmate the acid, he exposes it to frost; and observes that the temperature should not be too cold, because in that case the whole would become solid; and though the acid would thaw the first, it would always be productive of some inconvenience. In order to concentrate it to better advantage, the ice must be separated as it forms. The first ice is tasteless, and the last rather sour; and by this means the liqour is reduced to half. The acid thus concentrated is eight times as strong as the common acid, two drachms only being required to saturate one drachm of pot-ash. The citric acid, when thus purified and concentrated, may be kept for several years in a bottle; and serve for all uses, even that of making lemonade. The generality of chemists who have examined the combinations of the citric acid, have employed it in its original state, embarrassed with its mucilaginous principle. Such is the result of the experiments of Mr. Wenzel, who obtained only gummy products. But Mr. De Morveau, having saturated the purified acid with crystals of pot-ash, found a non-deliquescent salt at the end of a certain space of time. Bergman has represented the affinities of this acid in the following order; lime, barytes, magnesia, pot-ash, soda, ammoniac; but Mr. De Bressey, a French chemist, has observed, that barytes holds the first place, lime the second, and magnesia the third; and that the alkalis follow after these. From the researches of both, it appears that this acid prefers the three alkaline earths to the alkalis themselves.

CITRI'NULUS, a stone between a crystal and a beryl, called by Paracelsus *Saxifragus*. In Rulandus it is a pale crystal.

CITRON. See LIMON.

CITRON-WOOD, the wood of an American tree, called by the natives *candle-wood;* because, being cut into splinters, it burns like a candle. The tree is frequent in the Leeward Islands, and grows to a considerable size: the leaves are like those of the bay-tree, but of a finer green; the flower is sweet, and much like those of the orange; the fruit succeeding these is black, and of the size of a pepper-corn. The trunk is so like the yellow saunders in colour, that there was once an opinion that it was the same tree, and much of it was imported into Europe, and sold as such: but they were soon found to be different; the saunders being of a sweet scent, and but moderately heavy and resinous; but the citron-wood considerably heavy, very oily, and of a strong smell. It is not now used in medicine.

CITRUL, SICILIAN. See CITRULLUS

CITRU'LLUS; the Sicilian citrul, or WATER-MELON. The seeds of this plant, *Cucurbita citrullus; foliis multipartitis*, of Linnæus, were formerly used medicinally, but now only to reproduce the plant. Water-melon is cooling, and somewhat nutritious; but so soon begins to ferment, as to prove highly noxious to some stomachs, and bring on spasms, diarrhœas, cholera morbus, colics, &c.

CI'TRUS, the CITRON-TREE; a genus in Linnæus's botany. He joins with this genus the *Aurantium*, *Limon*, and *Lima*. There are four species. See LIMON.

CI'TRUS AURANTIUM; the systematic name of the orange tree. See AURANTIUM.

CI'TRUS MEDICA; the systematic name of the lemon tree. See LIMON.

CI'TTA, (from the Greek κιττα); the disease called PICA, or an unnatural longing for things not proper for food.

CIVET-CAT. See ZIBETHUM.

CIVE'TTA. See ZIBETHUM.

CLAP, a vulgar name for the Gonorrhæa. See GONORRHŒA.

CLARET, (from *clareo*, to be clear); a weak French wine, that may be given with great advantage as a tonic and antiseptic, where red port wine disagrees with the patient. In typhoid fevers of children and delicate females, Dr. Hooper asserts, it is far preferable, as a common drink.

CLARIFICATION, in pharmacy, the fining liquors from their grosser parts, to render them bright. This is generally done by beating up, with the whites of eggs, decoctions, or other turbid liquors, into a froth; which, upon boiling, will entangle the grosser parts, and carry them up to the top in the form of a tough scum; which is either taken off with a spoon, or separated by a flannel bag. Another way is, by suffering the liquor to stand in a convenient vessel, to allow the grosser parts to settle, which is also sometimes promoted by a mixture of such matter as will give what should settle a greater weight, and make it fall sooner, as in distilled waters, which are milky, fine sugar, with a few grains of alum, will carry down the oily parts, and leave the clear: and this is generally called depuration. See DEPURATION.

CLARY. See HORMINUM.

CLA'SSIS, (from κλαω, *to divide*), a CLASS, or scientific division or arrangement. It is an appellation given to the most general subdivisions of any thing, contrived for greater perspicuity: thus, *animals* are subdivided into CLASSES, as *quadrupeds*, *birds*, *fishes*, &c. which are again subdivided into *orders*, and these into *genera*. LINNÆUS, in his botanical arrangement, defines it to be an agreement of several genera in the parts of fructification, according to the principles of nature, distinguished by art. He divides the *vegetable kingdom* into twenty-four classes. Nosological writers preserve similar distinctions, dividing diseases into CLASSES, these into *orders*, ORDERS into *genera*, and GENERA into *species* and *varieties;* so that we are supplied with a concatenation of dependencies; the *orde*

upon the *class*, the *genera* upon the *order*, the *species and varieties* upon the *genera*. Cullen, Sauvages, Linnæus, &c. in their botanical and Nosological Arrangements, afford many instances.

CLA'SMIUM, the name of a genus of fossils, of the class of the gypsums; the characters of which are, that they are of a soft texture, and of a dull opaque look, being composed, as all the other gypsums, of irregularly arranged flat particles. The word is derived from the Greek κλασμος, *a fragment* or *small particle*; from the flaky small particles of which these bodies are composed. Of this genus there is only one known species; and this is of a tolerably regular and even structure; though very coarse and harsh to the touch.

CLA'THRUS, a genus in Linnæus's botany, of the order of *Fungi*. He enumerates four species.

CLA'USTRUM GU'TTURIS, the passage to the throat, which lies immediately under the root of the tongue and tonsils.

CLA'USTRUM VIRGINA'LE; a name for the hymen.

CLAUSU'RA, an imperforation of any canal or cavity of the body. Thus, *Clausura Uteri*, is a preternatural imperforation of the womb; *Clausura Tubarum Fallopianarum*, a morbid imperforation of the Fallopian tubes, which is mentioned by Ruysch as one cause of barrenness.

CLAVA'RIA, CLUB-TOP; a genus in Linnæus's botany, in the order of *Fungi*. He enumerates thirteen species.

CLAVI'CULA, (dim. of *clavis:* so called from its resemblance to *a key*), the clavicle or collar-bone; a bone shaped like the letter *ſ*, situated obliquely upon the upper part of the chest, and connecting the scapula and humerus to the thorax.

The clavicle, as well as other long round bones, is larger at its two ends than in the middle. The end next to the sternum is triangular: the angle behind is considerably protruded, to form a sharp ridge, to which the transverse ligament, extended from one clavicle to the other, is fixed. The side opposite to this is somewhat rounded. The middle of this protuberant end is as irregularly hollowed, as the cavity in the sternum for receiving it, is raised: but, in a recent subject, the irregular concavities of both are supplied by a moveable cartilage; which is not only much more closely connected every where by ligaments to the circumference of the articulation than those of the lower jaw are, but it grows to the two bones at both its internal and external ends; its substance at the external end being soft, but very strong, and resembling the intervertebral cartilages.

From this internal end, the clavicle, for about two fifths of its length, is bended obliquely forwards and downwards. On the upper and fore-part of this curvature a small ridge is seen, with a plain rough surface before it; whence the musculus sterno-hyoideus and sterno-mastoideus have in part their origin. Near the lower angle a small plain surface is often to be remarked, where the first rib and this bone are contiguous, and are connected by a firm ligament. From this a rough plain surface is extended outwards, where the pectoral muscle has part of its origin. Behind, the bone is made flat and rough by the insertion of the larger share of the subclavian muscle. After the clavicle begins to be bent backwards, it is round: but it soon after becomes broad and thin; which shape it retains to its external end. Along the external concavity, a rough sinuosity runs, from which some part of the deltoid muscle takes its rise; opposite to this, on the convex edge, a scabrous ridge gives insertion to a share of the cucullaris muscle. The upper surface of the clavicle is here flat; but the lower is hollow, for lodging the beginning of the musculus subclavius; and towards its back-part a tubercle rises; to which, and to a roughness near it, the strong short thick ligament, connecting this bone to the coracoid process of the scapula, is attached.

The external end of this bone is horizontally oblong, smooth, sloping at the posterior side, and tipped, in a recent subject, with a cartilage, for its articulation with the acromion scapulæ. Round this the bone is spongy, for the firmer connection of the ligaments. The clavicle, in its *substance*, is the same as of the other round long bones.

The medullary arteries having their direction obliquely outwards, enter the clavicles by one or more small passages in the middle of their back-part.

The triangular, unequal, interior end of each clavicle, has the cartilage above described interposed between it and the irregular cavity of the sternum. —The ligaments which surround this articulation to secure it, are so short and strong, that little motion can be allowed any way; and the strong ligament that is stretched across the upper furcula of the sternum, from the posterior prominent angle of the one clavicle to the same place of the other clavicle, serves to keep each of these bones more firmly in their place. By the assistance, however, of the moveable intervening cartilage, the clavicle can, at this joint, be raised or depressed, and move backwards and forwards so much as that the external end, which is at a great distance from that axis, enjoys very conspicuous motions. The articulation of the exterior end of the clavicle shall be considered with the description of the scapula. See SCAPULA.

Dr. Monro observes, that the clavicles of infants are not deficient in any of their parts; nor have they any epiphyses at their extremities joined afterwards to their bodies, as most other such long bones have, which preserve them from being bent too much, and from the danger of any unossified parts being separated by the force which pulls the arms forwards.

The clavicles are of considerable use, to keep the scapulæ, and consequently all the superior extremities, from falling in, and forward, upon the thorax; by which, as in most quadrupeds, the motions of the arms would be much confined, and the breast made too narrow. These bones likewise afford origin to several muscles, and a defence to large vessels.

From the situation, figure, and use of the clavicles, it is evident that they are much exposed to fractures; and their broken parts must generally pass each other; and that they are with difficulty kept in their place after that accident. See FRACTURE.

CLAVI'CULUS, in botany, a long fibrous thread issuing from a stalk, curling, and laying hold of any adjacent body. It is always produced at a joint, is also called *Tendril*, *Clasper*, and *Capreolus*.

CLA'VUS, (from *clavus*, a nail); a fixed pain in the forehead, which may be covered by one's thumb, giving a sensation like as if a nail were driven into the part. When connected with hysteria, it is called *clavus hystericus*. This term is also applied to *corns*, from their resemblance to the head of a nail. See CORNS.

CLAY, a familiar name for argillaceous earth, or alumine. See ALUMINE.

CLAY'TONIA, a genus in Linnæus's botany. He enumerates three species.

CLEANLINESS, freedom from dirt or filth. This, in its various modifications, so far as it is immediately connected with the welfare of the body, is very properly considered an object of every medical man's attention. It ought to extend its influence to every object that is connected with the human frame; to the preparation and consumption of food and drink, to dress, dwelling, household furniture, and all our physical wants.

"Let our clothes, linen, beds, covers, blankets, and sheets," says Dr. Willich, "be clean and dry; as all these substances absorb perspirable matter, and check the process of perspiration. Articles of dress which are soiled, and come into contact with the skin, being placed immediately over the pores, these reimbibe the humours already perspired, and return them to the body by the absorbents. Dirty linen will never attract the useless or noxious matter, which is secreted from the blood, and ejected from the body; it remains on the pores of the skin, and is either again absorbed by the vessels, or clogs those emunctories which require always to be kept open. For a similar reason it is highly improper and dangerous to wear the clothes of sick persons, especially in contagious distempers. See PESTIS, CONTAGION, &c.

"Let the body, and particularly the joints, be frequently washed with pure water; especially in summer, when the perspirable matter, being of an unctuous clammy nature, obstructs the excretion by the pores." It is evident, that nothing can be so effectual for this purpose as the use of a warm bath; which ought, in fact, to be considered a necessary part of the domestic economy, in every practicable instance. See BATHING.

CLEAVERS. See APERINE.

CLEI'DO-MASTOIDE'US. See STERNO-CLEIDO-MASTOIDEUS.

CLEI'SAGRA, (from κλεις, *the clavicle*, and αγρα, *a prey*); the gout in the articulations of the clavicles to the sternum.

CLE'MA, a twig or tendril of a plant; the same as *sarmentum*, or CLAVICULUS.

CLE'MATIS, (κληματις; from κλημα, *a tendril*); a plant, so named from its climbing up trees, or any thing it can fasten upon with its tendrils.

CLE'MATIS RECTA; the systematic name of the upright virgin's bower. See FLAMMULA JOVIS.

CLE'MATIS VITA'LBA; the systematic name of the plant called traveller's joy. See VITALBA.

CLE'OME, MUSTARDINE; a genus in Linnæus's botany. He enumerates twenty-two species.

CLEO'NIA, a genus in Linnæus's botany. There is but one species.

CLERODE'NDRUM, a genus in Linnæus's botany. He enumerates six species.

CLE'THRA, a genus in Linnæus's botany. There is but one species.

CLIBA'DIUM, a genus in Linnæus's botany. There is one species.

CLIFFO'RTIA, a genus in Linnæus's botany. Of this there are eighteen species.

CLIFTON-WATER, a medicinal spring, situated about a mile from Deddington in Oxfordshire. It is a weaker water of the same sort with that of Tilbury. See TILBURY-WATER.

CLIMACTERIC, (from *climacter*, a ladder), a critical year in a person's life. According to some, this is every seventh year; but others allow only those years produced by multiplying 7 by the odd numbers 3, 5, 7, and 9, to be climacterical. These years, they say, bring with them some remarkable change with respect to health, life, or fortune: the grand climacteric is the 63d year; but some, making two, add to this the 81st: the other remarkable climacterics are the 7th, 21st, 35th, 49th, and 56th.

CLIMATE, or CLIME, (from κλιμα, *inclinamentum*, an inclination); a part of the surface of the earth, bounded by two circles parallel to the equator; and of such a breadth, as that the longest day in the parallel nearer the pole, exceeds the longest day in that next the equator, by some certain spaces, viz. half an hour.

The *beginning* of the climate is a parallel circle wherein the day is the shortest. The *end* of the climate is that wherein the day is the longest. The climates therefore are reckoned from the equator to the pole; and are so many bands, or zones, terminating by lines parallel to the equator: though, in strictness, there are several climates in the breadth of one zone. Each climate only differs from its

contiguous ones, in that the longest day in summer is longer or shorter by half an hour in the one place than in the other. As the climates commence from the equator, the first climate at its beginning has its longest day precisely 12 hours long; at its end, 12 hours and a half: the second, which begins where the first ends, viz. at 12 hours and a half, ends at 13 hours; and so of the rest, as far as the polar circles, where, what the geographers call *hour-climates* terminate, and *month-climates* commence. As an hour-climate is a space comprised between two parallels of the equator, in the first of which the longest day exceeds that in the latter by half an hour; so the month climate is a space terminated between two circles parallel to the polar circles, whose longest day is longer or shorter than that of its contiguous one by a month, or 30 days.

The ancients, who confined the climates to what they imagined the habitable parts of the earth, only allowed of seven. The first they made to pass through Meroe, the second through Sienna, the third through Alexandria, the fourth through Rhodes, the fifth through Rome, the sixth through Pontus, and the seventh through the mouth of the Borysthenes. The moderns, who have sailed further toward the poles, make 30 climates on each side; and, in regard the obliquity of the sphere makes a little difference in the length of the longest day, instead of half an hour, some of them only make the difference of climates a quarter.

In familiar speech, the term *climate* is used to imply any country or region differing from another either in respect of the seasons, the quality of the soil, or even the manners of the inhabitants; without any regard to the length of the longest day. In this sense, the state of the atmosphere at different periods of the year is particularly considered. See Atmosphere.

CLIMBING BIRTHWORT. See Aristolochia tenuis.

CLINICAL, a term particularly used to signify the treating sick persons in bed, for the more exact discovery of all the symptoms of their diseases. Thus a *clinical* lecture, is a lecture delivered by the bed-side of the patient, and in which the lecturer refers his pupils to the actual situation of the patient.

CLINOID, (*clinoideus;* from κλινυ, *a bed*, and ειδος, *resemblance*); resembling a bed. This epithet is applied to four processes which surround the sella turcica of the sphænoid bone. Of these two are anterior, and two posterior. See Sphenoides.

CLINOPO'DIUM, field-basil; a genus in Linnæus's botany. He enumerates three species.

CLITO'RIA, a genus in Linnæus's botany. He enumerates five species.

CLITO'RIDIS MUSCULUS. Innes calls it *erector clitoridis*, and describes it as arising from the crus of the os ischium internally, and, in its ascent covering the crus of the clitoris, as far up as the os pubis. It is inserted into the upper part of the crus and body of the clitoris. Its use is to draw the clitoris downwards and backwards, and may serve to make the body of the clitoris more tense, by squeezing the blood into it from its crus.

CLI'TORIS, (κλειτοςις; from κλειος, *to enclose* or *hide;* because it is hidden by the labia pudendorum). The clitoris appears, at first sight, like a small imperforated glans. Its upper and lateral sides are covered by a kind of præputium, formed by a particular fold of a portion of the inner side of the alæ, which appears to be glandular, and to discharge a certain moisture, and its inside is granulated. On dissection, we discover in the clitoris, a trunk and two branches, as in the penis, consisting of a spongy substance, and of very elastic coats, but without any canal. This substance may be inflated either by air or by injection into the artery, &c. The trunk is divided into two lateral parts by a middle septum, from the bifurcation to the glans, where it is insensibly lost.

The bifurcation of the trunk is on the edge of the cartilaginous arch of the ossa pubis; and the branches, which resemble the roots of the corpora cavernosa, are inserted in the inferior rami of these bones, and in those of the ossa ischium, where they terminate by degrees; but there is sometimes a membranous tube on each side, which reaches to the tuberosity of the ischium. The trunk of the clitoris is sustained by a ligamentum suspensorium fixed in the symphysis of the ossa pubis, and containing this trunk in its duplicature, nearly as in the other sex.

Four muscles, or fasciculi of fleshy fibres, are inserted in the trunk of the clitoris, two on each side. One of them runs down on the foreside of the neighbouring corpus cavernosum, and is inserted by a tendinous or aponeurotic portion, partly in the extremity of the corpus cavernosum, and partly in the tuberosity of the ischium. These two muscles are called *erectores;* but the name of *ischio-cavernosi* would be more proper. The other muscle on each side lies under the former, and runs down on the side of the urethra and great orifice of the uterus, all the way to the anus, increasing gradually in breadth in its passage, and terminating partly like that which is called *accelerator* in males. These two muscles surround very closely the lateral parts of the urethra and of the great orifice. They expand very much as they descend, and are spread on the lower and lateral parts of the great orifice; for which reason several anatomists have considered them as muscular sphincters. All these four muscles, and especially the two latter, are oftentimes almost covered with fat.

The blood vessels of the clitoris come chiefly from the hypogastrics, and its nerves are derived from the second and third pairs of the nervi sacri,

by means of which they communicate with the inferior mesenteric plexus, and with the great sympathetic nerves.

CLITORI'SMUS; a morbid enlargement of the clitoris. Dr. Denman says, the *clitoris* is little concerned in the practice of the accoucheur, except sometimes on account of its size and situation. It is known to have been sometimes elongated and enlarged in such a manner as to equal the size of the *penis*, when it makes one of those many peculiarities which have been supposed to constitute an hermaphrodite, or an animal partaking of the sexual properties of the male and female (see HERMAPHRODITE); but if there are any examples of true hermaphrodites, the term is, in this case, improperly used. If the *clitoris* should increase to such a size as to occasion much inconvenience, the Dr. says, it may be extirpated either with the knife or ligature; but if the cause of the enlargement, which is commonly assigned, be true, it is not probable that any motive of delicacy or inconvenience will be a sufficient inducement to suffer the pain of extirpation.

In Vol. III. of the Medical and Physical Journal, Mr. Simmons, of Manchester, has described a case of morbid enlargement of the clitoris, the peculiarities of which are sufficiently apparent in the two views delineated in pl. xx.

CLOATHING; dress, or those garments which are put on as a covering for the naked body. The property of receiving, repelling, and emitting heat and cold, depends not only on the substance from which our dress is made, and its shape or form, but also on the colour. Clothes of a light colour have the least attraction for the sun's rays, and therefore are most used in tropical climates; but a recent discovery of Count Rumford's, set forth in the Philosophical Transactions, seems to have rendered the popular opinions on this subject doubtful.

Our cloathing consists of the following materials variously manufactured: 1. *Wool.*—This produces a moderate warmth, on account of the stimulus and gentle friction it occasions on the skin. By its action on the substances with which it is sometimes in contact, electricity is elicited, and perspiration promoted; whilst the perspired humours are absorbed into its substance and again gradually evaporated: but of this substance we shall speak more at large under the article FLANNEL. 2. *Linen.*—This, from its compactness, retains too much the perspirable humours, and does not part with them so gradually as wool. Shirts therefore produce a disagreeable cooling sensation when worn in contact with the skin. Perspiration is therefore stopped, more or less, according to the degree of suddenness by which the evaporation is produced, as on exposure to a current of air, &c. 3. *Silk.*—This occasions electricity and a gentle stimulus, but does not much increase perspiration; and being an animal product, it attracts much less humidity from the atmosphere than linen. It is therefore, when not woven of too close a texture, a very desirable and delicate covering for the skin; and may be resorted to by ladies, and others, whose cutaneous sensations are too much roused by the friction of wool. 4. *Cotton.*—This very prevailing manufacture, stands in the middle between animal wool and linen. It increases warmth, and transmits perspiration, less to the injury of the wearer, than linen, yet more readily than wool.

Dr. Willich observes, that all kinds of *fur* are more noxious than useful, both with respect to their structure and constituent parts. They are generally "too compact and unequal on the surface; they too much stimulate and increase perspiration, by promoting the access of humours to the skin; they do not allow the perspirable matter to escape, soon acquire an intolerable smell, and more than any other substance attract and retain contagious effluvia. Experience informs us, that nations who dress in fur, particularly in hot countries, are frequently exposed to diseases, owing to a want of cleanliness and free perspiration." Furs certainly, as immediate coverings for the skin, are objectionable on the latter account, but used as cloaks, or outer garments, in severe weather, they appear to be of all contrivances the most desirable.

"We ought," says Dr. Willich, "to choose a dress agreeable to the season and weather, as well as to the constitution of the body. Woollen clothes are the most proper in spring, autumn, and winter; because they moderately warm the body, and do not weaken it by the abstraction of too many exhalations; as they have fewer points of contact on the body, than any other materials of dress.

"In summer, most people are accustomed to wear thin clothes, which are scarcely proper in our changeable climate. It is not then advisable to take much exercise in thin dresses, particularly in the heat of the day. Nor should we venture to wear such clothes early in the morning, when the air is cool, and the pores of the skin have been enlarged by the warmth of the bed;—but still less in the evening, when the heat of the day has so much opened them, that perspiration may be easily checked, and health materially injured."

CLO'NICI SPASMI, (from κλονεω, *to move to and from*); clonic spasms. See CONVULSIONS.

CLOUD, a collection of aqueous vapours, suspended in the atmosphere, and rendered visible by the aggregation of their particles. Although it be generally allowed, that the clouds are formed from water so closely united, or dissolved within, the atmosphere, as to be invisible, it is, however, not easy to account for the long continuance of some very opaque clouds without their reconversion into water; or to assign a reason why the vapours, when

they have once begun to condense, do not continue to do so till they at last fall to the ground in the form of rain or snow, &c. It is now known that a separation of the latent heat from the water of which vapour is composed, is attended with a condensation of that vapour in some degree; in such case, it will first appear as a smoke, mist, or fog; which, if interposed between the sun and earth, will form a cloud; and the same causes continuing to operate, the cloud will produce rain or snow. It is however abundantly evident, that some other cause besides mere heat or cold is concerned in the formation of clouds, and the condensation of atmospherical vapours. This has been attributed to the electrical fluid; and indeed electricity is now generally admitted as an agent in all the great operations of nature. That the clouds, as such, have any sensible effect on the human body, farther than their influence on the moisture or weight of the atmosphere (see ATMOSPHERE), no well-informed writer has ventured to determine. On the imaginations of hypochondriacal persons, however, the effects of cloudy weather have been so notorious, as to occasion the popular name of "vapours" to be applied to that distressing affection of the nervous system.

CLOVE-BARK. See CASSIA CARYOPHYLLATA.

CLOVE-GILLIFLOWER. See CARYOPHYLLUM RUBRUM.

CLOVE-JULY-FLOWER. See CARYOPHYLLUM RUBRUM.

CLOVE-PINK. See CARYOPHYLLUM RUBRUM.

CLOVES. See CARYOPHYLLUM AROMATICUM.

CLU'PEA, the herring. See FISH.

CLU'SIA, the BALSAM-TREE; a genus of the monogynia order, belonging to the polygamia class of plants. There are four species, all natives of America. The most remarkable is the *slava*. This is pretty common in the British American islands, where the trees grow to the height of 20 feet, and shoot out many branches on every side, furnished with thick, round, succulent leaves placed opposite. The flowers are produced at the ends of the branches, each having a thick succulent cover. After the flowers are past, they are succeeded by oval fruit. From every part of these trees there exudes a kind of turpentine, called in the West Indies *hog-gum*.

CLU'TIA, a genus in Linnæus's botany. He enumerates nine species.

CLUTIA ELUTE'RIA, also called *Cascarilla clutia;* the systematic name of the tree which affords the cascarilla bark. See CASCARILLA.

CLYME'NUM, Spanish CHICKLING-VETCH; a species of LATHYRUS.

CLYPE'OLA, TREACLE-MUSTARD; a genus in Linnæus's botany. He enumerates three species.

CLY'SMUS; a clyster. See ENEMA.

CLY'SMA, (κλυσμα; from κλυζω, *to wash out*); a *Clyster*. See ENEMA.

CLY'SSUS, an ancient name for an extract prepared, not from one, but several bodies mixed together. Among the moderns, the term has been applied to several extracts prepared from the same body, and then mixed together.

CLYSTER. See ENEMA.

CNEO'RUM, a species of CONVOLVULUS, and a species of DAPHNE.

CNEO'RUM, WIDOW-WAIL; a genus in Linnæus's botany. There is but one species.

CNI'CUS, the CARTHAMUS. The seeds of the *carthamus* are also called by this name.

CNI'CUS, FOREIGN-THISTLE; a genus in Linnæus's botany. He enumerates nine species.

CNI'CUS SYLVE'STRIS, the CARDUUS BENEDICTUS.

CNIDELÆ'ON, a name for the oil made of the *Grana Cnidia*, or Cnidian berries. Some say these last are the fruit of the *Thymelæa;* others of the *Mezereon;* others of the *Cneoron.* Ray says the *Grana Cnidia* are the seeds contained in the berries of the *Thymelæa*. See COCCOGNIDIA.

CNI'DII CO'CCI. See COCCOGNIDIA.

CNI'DII GRA'NA. See COCCOGNIDIA.

CNIDO'SIS, (κνιδωσις), an itching and stimulating sensation, such as is excited by the nettle. Celsus renders it *Prurigo*.

CO'A, a plant so named by father Plumier, in honour of Hippocrates. The epithets COACUS, or COAN, are frequently applied to Hippocrates, or any thing which relates to him or his writings, from his being born in the island of Cos. Particularly it is an epithet of a treatise of Hippocrates's entitled "*Coacæ Prænotiones*."

COA'GULATION, (from *con* and *ago*, to drive together), in chemistry, the act of rendering a fluid body in some degree solid, by exposure to cold, or by the addition of some agent by which it is decomposed. Thus the white of eggs, the serum of the blood, &c. are coagulated by the addition of alcohol; milk, by mixture with acids; the serum of the blood, by exposure to heat, &c. The substance thus produced is called the *coagulum*. Many writers have called crystallization, congelation, &c. by the same name, but very improperly.

COA'GULUM ALU'MINIS; an article directed in the pharmacopœias. It is recommended as an efficacious application to relaxations of the conjunctive membrane of the eye. See ALUMEN.

COALTE'RNÆ FE'BRES; a sort of Fevers mentioned by Bellini, which are most probably imaginary. He describes them as two fevers affecting the same patient, and the paroxysm of one approaching as that of the other subsides.

COA'VA, a name for the infusion of coffee, as it is usually drank.

CO'BALT, one of the semi-metals. The most

common ore of cobalt is that called the *black* or *vitreous ore*, and *Kobalt Mulm* or *Schlaken Kobalt* by the Germans. It is found in a loose powdery form, sometimes resembling lamp-black, sometimes of a grey colour, in which state it is called *cobalt ochre;* but when in scoriform half-vitrified masses, it obtains the name of *vitreous* or *glassy ore.* When this kind of ore contains any sulphur or arsenic, they are only mechanically mixed with it. A small portion of copper, however, is sometimes found in it. It is frequently embodied in stones or sands of a black colour; sometimes it is contained in argillaceous earths of a blue or green colour. Talc, chalk, and gypsum, impregnated with it, are called by the same name; and by some, *spiegel cobalt.* Cobalt, mineralised by the *arsenical acid*, is found either loose and pure, or mixed with chalk or gypsum, or indurated and crystallized in tetrahedral crystals. It is also found in a stalactitical form. It frequently invests other cobaltic ores; and is found sometimes in stone and sand. Cobalt, mineralised by *sulphurated iron*, is of a colour nearly resembling tin or silver. It is sometimes found in large masses, sometimes in grains crystallized of a dull white colour, and frequently has the appearance of *mispickle.* A coarse grained kind of this ore, found in Sweden, becomes slimy in the fire, and sticks to the iron rods employed in stirring it, while calcining. The flaggy kind contains a large quantity of iron. Cobalt, mineralised by *sulphur*, *arsenic*, and *iron*, has a great resemblance to the harder kinds of grey cobalt ore; but it is never hard enough to strike fire with steel, and sometimes may even be scraped with a knife. The most shining kinds of this and the former species are called *cobalt glantz.*

Cobalt is dissolved by all the acids, but with different phenomena, according to the state of the semi-metal and the acid employed. If one part of this semi-metal be distilled with four parts of *sulphuric* acid, the sulphureous acid is produced, and the residue in the retort is the sulphate of cobalt, soluble in water, and capable of crystallizing in tetrahedral rhomboidal crystals, terminating in a dihedral summit. If one hundred grains of cobalt be dissolved in the sulphuric acid, and precipitated by soda, they afford one hundred and forty grains of precipitate; and if the precipitation be made by means of chalk, one hundred and sixty. Cobalt is dissolved by the *nitric* acid with effervescence; and the solution affords crystals in the form of needles, which have not hitherto been strictly examined. This salt is deliquescent, boils on the coals without detonating, and leaves a deep red oxyd. Mr. Chaptal has met with this salt in very short beautiful hexahedral pyramids. On charcoal it both fuses and decrepitates. It has not been found that the *muriatic* acid dissolves cobalt in the cold; but by the assistance of heat, it dissolves a part of it, making a sympathetic ink.

Neither cobalt nor any of its combinations, have as yet been applied to medical purposes.

COBHAM-WATERS; the waters of a spring, situated a mile south from Church-Cobham, about twenty-four miles from London. It is considered as one of the weaker saline purging waters.

COBO'B, the name of a kind of cookery among the Moors. It is made of several pieces of mutton wrapt up in the cawl, and afterwards roasted in it: the poorer people, instead of the meat, use the heart, liver, and other parts of the entrails, and make a good dish, though not equal to the former, as may well be supposed.

CO'CCALOS, a name of the CNIDIA, and of the NUX PINEA.

COCCI'FERA, the KERMES OAK-TREE; a species of QUERCUS.

COCCIFEROUS, (from *coccus*, a berry, and *fero*, to bear). All those plants or trees are so called which yield berries.

COCCINE'LLA, (dim. from *coccus*, a berry; from its resemblance to a little berry), COCHINEAL; the female of a species of insect called *Coccus cacti*, that is found on, and collected in South America from, the *Opuntia* or Indian fig-tree. It is ill-shaped, tardy, and stupid; its eyes, mouth, and antennæ, are fixed so deep, and are so concealed in the folds of the skin, that it is impossible to distinguish them without a microscope. The male is very scarce, and is sufficient for 300 females or more; it is active, small, and slender, in comparison with the female; its neck is narrower than the head, and still narrower than the rest of the body. Its thorax is of an elliptic form, a little longer than the neck and head put together, and flattened below; its antennæ are jointed, and out of each joint issue long slender hairs that are disposed in pairs on each side. It has six feet, each formed of distinct parts. From the posterior extremity of its body two large hairs or bristles are extended, which are four or five times the length of the insect. It bears two wings that are fixed to the upper part of the thorax, which fall like the wings of common flies when it walks or rests. These wings, which are of an oblong form, are suddenly diminished in breadth where they are connected to the body. This insect is said to possess stimulating qualities, and is ordered by the College in the *tinctura cantharidis*, *tinctura cardamomi composita*, *tinctura cinchonæ composita*, and some other preparations; but, most probably, on account of the beautiful red colour which it imparts to them, for Dr. Cullen has not chosen to recognise it as a medical remedy.

COCCOBA'LSAMON, a name for the fruit of the true balsam-tree.

COCCOGNI'DIA, *Grana cnidia;* or *Cocci cnidii.* The seeds of the *Daphne mezereum* are so termed. They are violently purgative.

COCCOLO'BA, the SEA-SIDE GRAPE; a genus in Linnæus's botany. He enumerates seven species.

COCCO'NES, the grains or acini of the pomegranate.

CO'CCOS, a name for the cacoa. See CACOA.

CO'CCULUS I'NDUS, (*cocculus*, formed of κοκκυλος, dim. of κοκκος, *a berry*). The berry so called is rugous and kidney-shaped, and contains a white nucleus; it is the produce of the *Menispermum cocculus; foliis cordatis, retusis, mucronatis; caule lacero*, of Linnæus. These berries possess an inebriating quality; and are supposed to impart that power to most of the London porter. Fishermen have a way of mixing them with paste, which the fish swallow greedily, and are thereby rendered lifeless for a time, and float on the water, so as to be easily taken. The old women use it with stavesacre, for destroying lice in children's heads.

CO'CCUS BA'PHIA. See HERMES.

CO'CCUS CACTI; the systematic name of the cochineal insect. See WOCCINELLA.

COCCYGE'US, (from κοκκυξ: *because it is inserted into the coccyx)*; a muscle of the os coccygis situated within the pelvis. It arises, tendinous and fleshy, from the spinous process of the ischium, and covers the inside of the sacro-ischiatic-ligament: from this narrow beginning it gradually increases to form a thin fleshy belly, interspersed with tendinous fibres. It is inserted into the extremity of the os sacrum, and near the whole length of the os coccygis, laterally. Its use is to support and move the os coccygis forwards, and to tie it more firmly to the sacrum. See COCCYGIS.

CO'CCYGIS OS, (from κοκκυξ, *a cuckow*, whose bill it is said to represent), also called *os coccyx*, a bone situated at the extremity of the os sacrum, and in some measure an appendix to it. It bends forward towards the pelvis; the fore side is flat, the back part rather convex. It is made up of four or five shoulders, like false vertebræ, joined together by cartilages more or less pliable; though sometimes all the pieces are found to be cemented together.

The highest of the four bones is the largest, with shoulders extended farther to each side than the end of the os sacrum; which enlargement Dr. Monro thinks, should serve as a distinguishing mark to fix the limits of either bone; and take away all dispute about reckoning the nnmber of bones, of which one or other of these two parts of the false vertebræ is composed; which dispute must still be kept up, as long as the numbering five or six bones in the os sacrum depends upon the uncertain accident of this broad-shouldered little bone being united to or separated from it. The upper surface of this bone is a little hollow. From the back of that bulbous part, called its shoulders, a process often rises up on each side, to join with the bifurcated spine of the fourth and fifth bones of the os sacrum, to form a bony bridge. Sometimes these shoulders are joined to the sides of the fifth bone of the os sacrum, to form the hole in each side common to these two bones, for the passage of the twenty-ninth pair of spinal nerves. Immediately below the shoulders of the os coccygis, a notch may be remarked on each side, where the thirtieth pair of the spinal nerves passes. The other pieces are irregular squares, diminishing in size as they descend. When the cartilages ossify, the upper end of each bone is formed into a cavity, exactly adapted to the protuberant lower end of the bone immediately above. From this sort of articulation, it is evident, that, unless, when these bones grow together, all of them are capable of motion; of which the first and second, especially the latter, enjoys the largest share. To the sides of these bones of the os coccygis, the coccygæi muscles, and part of the levatores ani, and of the glutæi maximi, are fixed. The lower end of the fourth bone terminates in a rough point, to which a cartilage is appended.

The substance of these bones is very spongy, and in children cartilaginous; there being only a part of the first bone ossified in a new born infant. Since therefore the intestinum rectum of children is not so firmly supported as it is in adults, this may be one reason why they are more subject to a procidentia ani than grown people.

From the description of this bone, we see how little it resembles the vertebræ; since it seldom has processes, never has any cavity for the spinal marrow, nor holes for the passage of nerves. Its connection hinders it from being moved to either side; and its motion backwards and forwards is much confined; yet, as its ligaments can be stretched by a considerable force, it is of great advantage in the excretion of the alvine fæces, and much more in child-bearing, that this bone should remain moveable; and Dr. Monro says, the right management of it, in delivering women, may be of great benefit to them. He also says, the mobility of the os coccygis diminishing as people advance in age, especially when its ligaments and cartilages have not been kept flexible by being stretched, is probably one reason why the women, who are old maids before they marry, have generally difficult parturition.

The os coccygis serves to sustain the rectum; and, in order to perform this office more effectually, it is made to turn with a curve forwards; by which also the bone itself, as well as the muscles and teguments, is preserved from any injury when we sit with the body reclined back.

COCHINEAL. See COCCINELLA.

CO'CHLEA, (κοχλεα; from κοχυιζω, *to turn round*); a cavity of the internal ear. It is a sort of spiral body with two ducts, formed in the anterior part of the pars petrosa, somewhat resembling the shell of a snail. The parts to be distinguished in it, in its true situation, are, the basis; the apex; the spiral lamina, or half septum, by which its cavity is divided into two half canals; the mo-

diolus or spindle, round which the cochlea turns; and, lastly, the orifices and union of the two ducts. The basis is turned directly inward toward the internal foramen auditorium; the apex outward; and the axis of the modiolus is nearly horizontal; but, in all of them, allowance must be made for the obliquity of the pars petrosa in which they lie.

The *basis* of the cochlea is gently hollowed; and, toward the middle, perforated by several small holes. The modiolus is a kind of short cone, with a very large basis, which is the middle of the basis of the cochlea. Through its whole length runs a double spinal groove, which, through a microscope, shews a great number of pores. The cochlea makes about two turns and a half from the basis to the apex; and the two half canals, being firmly united together through their whole course, form a half septum, called *lamina spiralis;* which must not be confounded, as it often is, with the complete septum in the recent subject. One edge of the lamina spiralis is strongly joined to the modiolus, being thicker there than in any other place; whereas the other edge is terminated all round by a very thin border, lying in the middle cavity of the cochlea. In the natural state, the other half of the septum is membranous, and completes the partition between the two canals. The two half canals turn jointly about the modiolus; one being situated toward the basis of the cochlea, the other toward the apex; for which reason Dr. Monro always called one of them *internal*, the other *external.*

The spiral or *volute* of the cochlea begins at the lower part of the vestibule; runs from thence forward to the top, then backward down to the bottom; afterward upward and forward, and so on from the basis, which is turned inward, to the apex which is turned outward. From this description, it is easy to know to which ear any cochlea belongs when we see it prepared: it likewise teaches us, that, in the right cochlea, the direction of the turnings is the same as in garden snails, and almost all the other common shells; but, in the left cochlea, the turnings are in a contrary direction. The two half canals communicate fully at the apex of the cochlea. Their separate openings are towards the basis, one of them being immediately into the lower part of the foreside of the vestibulum, the other into the fenestra rotunda.

COCHLEA'RE, (from *cochlea*, a cockle, whose shell its bowl represents); a spoonful. Most commonly, in prescriptions, it is abbreviated thus: *cochl.* i. e. *cochleare magnum*, a table spoonful. *Cochleare medium*, denotes a desert or pap spoonful; and *cochleare minimum* a tea spoonful. The ancients had two kinds of *Cochlearia;* the greater, which contained a drachm, and the lesser, which contained a scruple. In the present London and Edinburgh Dispensatories, a cochleare is half an ounce of syrup, and three drachms of water, *in weight.*

COCHLEA'RIA ARMORA'CIA; the systematic name of the common horse-radish. See RAPHANUS RUSTICANUS.

COCHLEA'RIA HORTE'NSIS, (*cochlearia;* from the resemblance of its leaves to a spoon), the LEMON SCURVY-GRASS, an indigenous plant. It is the *Cochlearia officinalis*, Linn. *Cochlearia foliis radicalibus cordato-subrotundis; caulinis oblongis subsinuatis.* Class, *Tetradynamia.* Order, *Siliculosa.* It is cultivated in gardens for its medicinal qualities. Its expressed juice has been long considered as the most effectual of the scorbutic plants. Its sensible qualities being as great, if not greater, than any other of this order, Dr. Cullen considers sufficient vouchers of this. The entire herb has often been employed, and eaten fresh as a sallad, and it has been made into a conserve with three times its weight of sugar; but the virtues are not well preserved in the latter way. The most common practice is to employ the expressed juice; and this plant makes a chief part of the *Succ. cochl. comp.* both of the London, and Edinburgh Dispensatories. This Dr. Cullen speaks of as a very useful medicine.

It formerly was an ingredient in the *spiritus raphani compositus* of the Edinburgh Dispensatory, and still stands in that of the London and Dublin Colleges; but as the whole of its virtues are not extracted by distillation, it is now omitted in the first of these. Several foreign dispensatories have ordered it to be treated by distillation with spirit of wine, and have thereby obtained a volatile poignant spirit, that may prove an useful stimulus in particular cases. Dr. Cullen suggests it as an improvement, the combination of cochlearia with the volatile acid of tartar, as in the *spiritus antiscorbuticus Drawitzii;* and in this state, he presumes it may be a good stimulant in paralytic cases. It has also been employed as a diuretic, and in this way it may, also, do good in scurvy; but in this form, Dr. Cullen thinks its antiscorbutic properties are not to be depended upon, and fall far short of the virtues of the plant in substance.

Succus Cochleariæ Compositus. Lond.

Take of the Juice of Garden scurvy-grass, two pints;
Brooklime,
Water-cresses, of each one pint;
Seville oranges, twenty ounces, by measure.
Mix them, and, after the feces have subsided, pour off the liquor, or strain it.

Succus Cochleariæ Officinalis Compositus. Edin.

Take of the Juice of Scurvy-grass,
Water-cresses, fresh gathered,

Seville oranges, of each two pounds;
Spirit of nutmegs, half a pound.
Mix them, and let them stand till the feces have subsided, then pour off the clear liquor.

Dr. A. Duncan says, both the above compositions are of considerable use as antiscorbutics; and that the orange juice assists in the composition of such remedies; which, when thus prepared, have been found, from experience, to produce better effects than when the articles have been employed by themselves. These juices may be taken in doses from an ounce or two to a quarter of a pint, two or three times a-day: they generally increase the urinary secretion, and sometimes induce a laxative habit.

COCHLEA'RIA OFFICINA'LIS; the systematic name of the lemon scurvy-grass. See COCHLEARIA HORTENSIS.

CO'COS, the cocoa-nut-tree; a genus in Linnæus's botany. There are two species.

CO'COS BUTYRA'CEA; the systematic name of the plant which affords the palm-oil. See PALM-OIL.

COCTION, concoction or digestion. The ancients distinguished concoction into several stages, but without any good reason. With them the term coction also signified that alteration, whatever it might be, or however occasioned, which is made in the supposed crude matter of a disease, by which it was either rendered more fit to be discharged, or no longer hurtful to the body. Their reasoning on this subject is now unintelligible.

CO'DAGA-PALA. See CONESSI CORTEX.

CO'DIA, (κωδια), in botany, signifies the top or head of any plant, but it is, by way of eminence, attributed to the poppy; whence the syrup of poppy is called *diacodium.*

CO'DIA, a genus in Linnæus's botany. There is but one species.

CO'DON, a genus in Linnæus's botany. There is but one species.

CŒ'CUM. See CÆCUM.

CŒLI'ACA ARTERIA, (*cœliacus*, belonging to the belly; from κοιλια, *the belly*); the cœliac artery. It is the first branch given off from the aorta in the cavity of the abdomen. It rises anteriorly and a little to the left side, from the aorta descendens, immediately after its passage through the small muscle of the diaphragm, nearly opposite to the cartilage between the last vertebra of the back and first of the loins. The trunk of this artery is very short; and near its origin it frequently sends off the right diaphragmatic artery. Immediately after this, the cœliaca divides into three branches: one runs upwards, termed *arteria ventriculi coronaria;* one toward the right hand, named *arteria hepatica;* the other to the left, called *splenica,* which is larger than the former. These three branches occur at the same place, very near its origin; the trunk going out from the aorta almost in a straight line, and the branches from the trunk almost at right angles, like radii from an axis; whence this trunk has been called *axis arteriæ cœliacæ.* Frequently, however, the ventriculi coronaria comes off first, and then the cœliaca divides into two branches.

CŒLI'ACA PA'SSIO; the Cœliac Passion. There are very great differences among physicians concerning the nature of this disease. Sauvages says, from Aretæus, it is a chronic flux, in which the aliment is discharged half digested. Dr. Cullen considers it as synonymous with diarrhœa, and mentions, in his third and fourth species, under the terms *mucosa, chylosa, lactea,* making the *purulenta* only symptomatic. See DIARRHŒA. It is attended with great pains of the stomach, resembling the pricking of pins; rumbling and flatus in the intestines; white stools, because deprived of bile; while the patient becomes weak and lean. The disease is tedious, periodical, and difficult to be cured. Sauvages adds, that none of the moderns seem to have observed the disease properly; since the excrements indeed are white, on account of a deficiency of the bile, but the belly is bound as in the jaundice. Dr. Cullen says, there is a dejection of a milky liquid of the nature of chyle; but this is treated by Vogel as a vulgar error. He accuses the moderns of copying from Aretæus, who mentions white fæces as a fymptom of the disease; from whence authors have readily fallen into the notion that they never appeared of any other colour in persons labouring under the cœliac passion. This error quickly produced another, which has been very generally received; namely, that the chyle was thrown out of the lacteals by reason of some obstruction there, and thus passed along with the excrements; of which, he says, there is not the least proof; and agrees with Aretæus, that the whiteness is only occasioned by the want of bile. He endeavours to prove at length, that the cœliac passion can neither be occasioned by an obstruction of the lacteals, nor of the mesenteric glands; though he owns that such as have died of this disease and were dissected, had obstructions in the mesenteric glands; but he denies that all those in whom such obstructions occur, are subject to the *cœliac passion.* He considers the disease as arising from a cachexy of the stomachic and intestinal juices; and directs the cure to be attempted by emetics, purgatives, and tonics, as in other species of diarrhœa.

CO'FFEA, (from *kofuah*, Hebr. *a mixing together*; so called from the pleasant potation which is made from its berry); the COFFEE-TREE. *Coffea arabica: floribus quinquifidis, dispermis,* Linn. Class, *Pentandria.* Order, *Monogynia.* The fruit, which is the only useful part, resembles a cherry. It grows in clusters, and is ranged along

the branches under the axillæ of the leaves, of the same green as the laurel, but something longer. When it comes to be of a deep red, it is gathered for the mill, in order to be manufactured into those coffee-beans, the agreeable infusion of which is so generally known. See Coffee. The coffee-tree is cultivated in Arabia, Persia, the East Indies, the Isle of Bourbon, and several parts of America.

CO'FFEA ARA'BICA; the plant whose seeds are called coffee. See Coffea, and Coffee.

COFFEE, a kind of infusion, prepared from the berries of the *Coffea Arabica.* It has been very familiar in Europe for above 100 years, and among the Turks 200. The origin of this practice, however, is not well known. The preparation of coffee consists in roasting, or giving it a just degree of torrefaction on an earthen or metalline plate, till it acquire a brownish hue, equally deep on all sides. It is then ground in a mill, as much as serves the present occasion, and infused, in a way with which every one is familiar, in a proper quantity of boiling water.

From sixteen ounces of roasted coffee, Neumann obtained seven ounces, two drachms, and two scruples of watery extract; and afterwards five drachms and one scruple of spirituous extract. On reversing the operation, he obtained four ounces and four scruples of spirituous extract, and four ounces of watery: the residuum, in both cases, was nearly the same; *viz.* about one-half of the whole.

Very different accounts have been given of the medicinal qualities of this berry. To determine its real effects on the human body, Dr. Percival made several experiments, the result of which he gives in his Essays, vol. ii. p. 127.

"The medicinal qualities of coffee" says he, "seem to be derived from the grateful sensation which it produces in the stomach, and from the sedative powers exerted on the *vis vitæ.* Hence it assists digestion, and relieves the head-ach; and is taken in large quantities, with peculiar propriety, by the Turks and Arabians; because it counteracts the narcotic effects of opium, to the use of which those nations are so much addicted.

"In delicate habits, it often occasions watchfulness, tremors, and many of those complaints which are denominated nervous. It has been even suspected of producing palsies; and, from my own observation, I should apprehend, not entirely without foundation. Slare affirms, that he became paralytic by the too liberal use of coffee, and that his disorder was removed by abstinence from that liquor."

Sir John Pringle has observed, "it is the best abater of the paroxysms of the periodic asthma that I have seen. The coffee ought to be of the best Mocco, newly burnt, and made very strong, immediately after grinding it. I have commonly ordered an ounce for one dish; which is to be repeated fresh, after the interval of a quarter or half an hour; and which I direct to be taken without milk or sugar. This medicine, in general terms, is mentioned by Musgrave, in his treatise *De arthritide anomala.*" He farther adds, that he has frequently directed coffee in the asthma with great success.

If coffee be drunk warm within an hour after dinner, it is of singular use to those who have headachs from a weakness in the stomach, contracted by sedentary habits, close attention, or accidental drunkenness. It is of service when the digestion is weak; and persons affected with the sick-headach, are much benefited by its use in some instances; though this effect is by no means uniform.

COHESION, (*cohæsio*, from *con*, and *hæreo*, to stick together); that force, in the particles of matter, whereby they are connected in such a way, that they resist any attempt towards their removal or separation. It is one of the species of attraction. See Attraction.

COHOBATION, a term invented by Paracelsus. The ancient chemists used this term, to signify, the distillation of a fluid poured afresh upon a substance of the same kind as that upon which it was before distilled, and so repeating this operation several times, to make it more efficacious. For this purpose the vessel called a *pelican* was employed. See pl. xix.

COI'RA; a name given by the natives of Bahar province to the Mimosa Japonica.

CO'ITUS, (from *coeo*, to go together); the conjunction of the male and female in the act of procreation. See Conception.

CO'IX, Job's-tears; a genus in Linnæus's botany. He enumerates one species.

COLATO'RIUM, a strainer of any kind.

COLATU'RA, any strained or filtered liquor is called the colature.

CO'LCHICUM, (from *Colchis*, a city of Armenia; where this plant is supposed to have been common); the common meadow-saffron, or *Colchicum autumnale*, Linn. *Colchicum foliis planis lanceolatis erectis.* Class, *Hexandria.* Order, *Trigynia.* It is a bulbous-rooted plant, growing in wet meadows in Britain, and most of the temperate countries of Europe. It flowers early in the autumn, at which time the old bulb begins to decay, and a new one is formed. In the following May, the new bulb is perfected, and the old one wasted. The sensible qualities of the fresh root are very various, according to the place of growth, and season of the year. In autumn it is almost inert; but in the beginning of summer highly acrid: hence some have found it to be a corrosive poison, whilst others have eaten it, in considerable quantity, without experiencing any effect. When it is possessed of acrimony, this is of the same nature with that of garlic, and some other plants, and it is entirely destroyed by drying. The German physicians, baron Storck, Collin, and

Plenck, have celebrated its virtues as a diuretic, in hydrothorax and other dropsies; but it is nevertheless found, at best, a very uncertain remedy. The expressed juice is used, in Alsace, to destroy vermin in the heads of children.

The officinal preparations of colchinm are: *Syr. colch. autumn.* Edin. *Oxymel colchici*, Lond. but they are rarely resorted to in practice.

CO'LCHICUM AUTUMNA'LE; the systematic name of the common meadow saffron. See Colchicum.

CO'LCHICUM ILL'YRICUM; the plant supposed to afford the *hermodactyls.* See Hermodactyli.

CO'LCOTHAR. If the calcination of vitriolated iron be pushed further, a part of the vitriolic acid is dissipated in sulphureous acid, and the iron is calcined. What remains in the crucible is an oxyd of iron, of a high red colour, which still retains a large quantity of vitriolic acid, half combined with it. See Iron.

COLD, the privation, or absence of heat. See Caloric. Its immediate effects on the human body are, contraction of the cutaneous pores, and a temporary obstruction of insensible perspiration. Hence we perceive what is vulgarly called the "goose skin," and the parts thus affected will not recover their usual elasticity, till the spasm be removed, either by external or internal heat, or by friction, which excites the latter. At present we shall only treat of the consequences resulting from an *excess of cold.*

Nature has enabled our frail and complicated frame, to support the heat and cold of different climates, with equal facility. The human body contains within itself, as long as it is living (see Living Principle), a principle of warmth. If any other body, being in contact with it, does at the same time impart to it more caloric or heat than it obtains from the human body, it is said to be warm; but if it receives from the human body more heat than it remits, it is said to be cold. But though man has devised artificial means of defending his body against the action of cold, or more properly, of retaining the inbred, or vital heat, yet it often happens that, by exposure to extreme cold, the fingers, ears, toes, &c. are *frozen:* thus, the natural heat of those parts is reduced to the lowest point consistent with life. If, in such cases, artificial heat be too suddenly applied, a mortification will ensue, and the frost-bitten parts spontaneously separate. Hence they ought to be thawed, either by rubbing them with snow, or immersing them in cold water, and afterwards applying warmth in the most careful and gradual manner; by which they will soon be restored to their usual tone and activity. Indeed (as a popular writer justly observes), the great secret, or art, of restoring suspended animation, consists in nicely adjusting the natural and artificial stimuli, to the exact tone of the irritable fibre. See Frost.

As moderate cold produces at first debilitating, and eventually bracing, effects on the animal body, it is the most beneficial temperature in the cure of febrile, and such diseases as are not attended with extreme debility (see Cold Affusion); but it should never be followed by any considerable degree of heat. Sydenham, more than a century ago, pointed out the evils attendant on too much heat in sick-rooms; he seldom would allow his patients even to lie in bed, and very judiciously directed the rooms to be constantly ventilated with cool air. The great benefit derived from this practice in the small-pox, is now generally acknowledged, and arises chiefly from avoiding the stimulus of heat, in the eruptive fever.

The greater degree of cold produced by *evaporation*, Dr. Darwin observes, is now well understood. In all chemical processes, where aërial or fluid bodies become consolidated, part of the *latent heat* is pressed out, as in the instant when water freezes, or unites with quick-lime. On the contrary, when solid bodies become fluid, or fluid ones become aerial, heat is absorbed by the solution: whence it may be said, in general, that all chemical combinations produce heat, and all chemical solutions generate cold. This should teach the careful gardener, not to water tender vegetables in the heat of sun-shine, or in a warm dry wind, lest the hasty evaporation should produce so much cold as to destroy them; an effect that will the more certainly follow, as they have been previously too much stimulated by heat, in consequence of which, the power of life, or irritability, had been already diminished.

When treating on the diseases of plants, Dr. Darwin remarks, that though excessive heat is seldom very injurious to vegetation in this country, yet the defect of that element, or, in common language, excess of cold, is frequently destructive to the tender shoots of the ash, and the early blossoms of many fruit-trees, such as apples, pears, apricots, &c.—The *blights* occasioned by frost, generally happen in the spring, when warm sunny days are succeeded by cold nights, as the living power of the plant has then been previously exhausted by the stimulus of heat, and is, therefore, less capable of being excited into the actions necessary to vegetable life, by the greatly diminished stimulus of a freezing atmosphere.

The *properties of cold* seem to be directly opposite to those of heat: the latter increases the bulk of all bodies; the former contracts them; and, while fire tends to dissipate their substance, cold condenses them, and strengthens their mutual cohesion. But, though cold thus appears, by some of its effects, to be nothing more than the absence or privation of heat, as darkness is only the defect

of light, yet cold is probably possessed of another quality, which has induced many to consider it as a substance of a peculiar nature. It is well known, that when a continuance of cold has contracted and condensed bodies to a certain degree, if then its power be increased, instead of progressively lessening their bulk, it enlarges and expands them, so that extreme cold, like heat, swells the substance into which it enters. Thus fluids sensibly contract in a cold temperature, till the moment they begin to freeze, when they immediately dilate, and occupy more space than they possessed while in a state of fluidity. Hence, liquor frozen to ice in a close cask, is often known to burst the vessel: when ice is broken on a pond, it swims upon the surface; a certain proof of its being lighter, or of a larger bulk, than an equal quantity of water. This dilatation of fluids, however, is probably owing to a cause very different from that of excessive cold alone; because the power of freezing may be artificially increased, while the intenseness of the cold receives no considerable addition; and, on the contrary, a substance capable of melting ice, will increase the degree of its coldness. Thus, for instance, sal ammoniac mixed with pounded ice, or with snow, melts either of them into water; and increases their cold to a surprising degree, as is obvious from the effects of this mixture, in sinking the thermometer. Hence Dr. Willich imagines, that the freezing of fluids cannot be entirely considered as the result of cold, but of some unknown property either in the air or water, which thus mixes with the body, and for a time destroys its fluidity.

The sudden and long application of cold to the body is a fruitful source of disease: hence the means of avoiding it are to be assiduously consulted. See Cloathing, Flannel, &c. Its effects and the methods of counteracting them may be seen under the articles Catarrhus, Rheumatism, Fever, &c.

COLD; a popular name for a catarrhous affection of the nostrils, throat, and fauces. See Catarrh.

COLD AFFUSION, a process introduced by Dr. Currie, of Liverpool, in the treatment of typhous fever, and which, by the author's account, as well as from the testimony of others, appears to possess an uniformity of success which we look for in vain in almost any other branch of medical practice. The remedy consists merely in placing the patient in a bathing tub, or other convenient vessel, and pouring a pailful of cold water upon his body; after which, he is wiped dry and again put to bed. It should be noted: 1. That it is the *low contagious fever*, in which the cold affusion is to be employed: the first symptoms, a dull head-ach, with restlessness and shivering; pains in the back and all over the body, the tongue foul, with great prostration of strength; the head-ach becoming gradually more acute, the heat of the body, by the thermometer, 102° to 105° or more; general restlessness, increasing to delirium, particularly in the night. See Typhus. 2. That it is *in the early stage of the disease* we must employ the remedy; and generally *in the state of the greatest heat and exacerbation.* 3. It is *affusion, not immersion*, that must be performed.

In order to understand the *modus operandi* of affusion, as explained by Dr. Currie, it will be necessary first to understand his theory of fever. This theory is, in its principal features, extremely similar to Dr. Cullen's. The remote causes which may produce fever are various, and many of them have probably eluded the research of medical science. Whatever the remote cause is, however, it may perhaps be considered as a poison acting directly on the *sensorium commune*, and with a malignancy proportioned to the degree of its concentration.

Its first effect is a debility which is distinctly marked on the countenance; the necessary consequence, or, as some contend, the concomitant effect, is a spasm or contraction of the arteries, but more especially of the extreme vessels, and the capillaries, of the surface. A re-action or resistance commences; the heart and lungs are roused into increased exertion by the pressure of the accumulated fluids, and repel them back on the surface and extremities; while the spasmodic or morbid structure of these extreme vessels opposes the reflux of the fluids, and thus, by maintaining the inordinate pressure on the centre, excites the heart, arteries, and lungs to still more violent exertions. In this contest, the stomach is usually brought into sympathy, and nausea and vomiting are often induced.

Dr. Currie remarks, that it is exceedingly difficult to raise the heat of the body, in a state of health, to the highest degree of fever-heat, either by heated air or heated water; the heat, as it is introduced into the system of a healthy person by means of the surrounding medium, being dissipated by profuse perspiration, or by some other living process, of which perspiration is a concomitant effect. "In fever, this is prevented, for the peculiar debility induced by the remote cause, occasions, or is attended by, a spasm or morbid stricture of the capillaries of the surface, and of the skin itself; by which the insensible perspiration is prevented from increasing in proportion to the heat, and the sensible perspiration is obstructed." Hence the difficulty of abating the heat in fever; the reduction of which, moreover, is attended with hazard, since the patient cannot, in general, bear the continual exposure to external cold necessary for this purpose: for even in the hot stage, if the patient is exposed naked to a cold atmosphere, although the application is at first agreeable and advantageous, "as the

heat of the surface approaches the standard of health, a sudden sense of chilliness comes on, with a return of oppression on the heart and lungs, and all the symptoms of the first stage of the paroxysm. In any continued application of cold, therefore, care must be taken to keep it within the limits in which it is grateful to the sensations: here it is advantageous; but though it moderates re-action, it does not in general remove the spasm on the capillaries, or break the association or habit by which fever is prolonged. This is effected by the sudden affusion of cold water over the naked body." Dr. Currie thus explains the mode of its operation :—" The sudden, general, and powerful stimulus given to the system, dissolves the spasm on the extreme vessels of the surface, and of the various cavities of the body: the sudden and general evaporation carries off a large portion of the morbid heat accumulated under the skin, and the healthy action of the capillaries and exhalents being restored, the remaining superfluous heat passes off by sensible and insensible perspiration. The stimulus of morbid heat, and of morbid stricture, being removed, the morbid association seems also to be broken by the sudden and powerful impression on the sensations. In fact, the inordinate action of the heart and arteries subsides, and the harassed and toil-worn patient sinks into that peaceful sleep, which nature has provided as the solace of our pains and sorrows, and the restorer of our strength."

Since the first publication of Dr. Currie's work, the practise of affusion has been extended throughout England; and its efficacy has been established in some stages of the disease from which the author had originally proscribed the practice of it. One of the cautionary injunctions which had been given for the affusion of cold water in fever, was, *never to employ it in cases where the patient had a sense of chilliness upon him*, even if the thermometer, applied to the trunk of the body, indicated a preternatural degree of heat. In these cases, the surface is exquisitely alive to impressions of cold, and indeed the patient exhibits an extraordinary sensibility in the senses of hearing, sight, and taste. Such cases are usually attended by spasmodic affections of the voluntary muscles, restlessness, and delirium, and have uniformly terminated fatally; opium, bark, camphor, wine, æther, and musk, proving wholly useless, if not injurious. In his last edition of Reports, however, Dr. Currie has given the particulars of a case of this description, communicated by Mr. Dalrymple, of Norwich, in which the cold affusion was so managed as to produce a successful event. This account, and Dr. Currie's remarks upon it, are highly deserving of attention.

In fevers *arising from, or accompanied by, topical inflammation*, his experience does not justify the use of the cold affusion; though in a great variety of these cases, the warm affusion may be used with advantage. " And," says he, " though I have used the cold affusion in some instances so late as the twelfth and even fourteenth day of contagious fever, with safety and success, yet it can only be employed, at this advanced period, in the instances in which the heat keeps up steadily above the natural standard, and the respiration continues free. In such cases I have seen it appease agitation and restlessness, dissipate delirium, and, as it were, snatch the patient from impending dissolution. But it is in the *early stages* of fever (let me again repeat) that it ought always to be employed, if possible; and where, without any regard to the heat of the patient, it is had recourse to in the last stage of fever, after every other remedy has failed, and the case appears desperate, (of which I have heard several instances) can it appear surprising that the issue should sometimes be unfavourable?"

In his second volume, Dr. Currie has related a great variety of cases in which the cold and tepid affusion have been successfully employed in the *scarlatina anginosa*. This disease broke out at Liverpool with great virulence in the summer of 1801, and gave Dr. Currie abundant opportunities to decide on the efficacy of affusion as a remedy. Two of his own children were seized with it, both boys, one five, and the other three years old. The heat rose in the eldest, to 109°, in the youngest to 108°, and the pulse in each was upwards of 150! As soon as the sensation of heat was steady in each, the child was stripped: " in thirty-two hours, the first had the affusion fourteen times; eight times cold, twice cool, and four times tepid. Twelve affusions sufficed in the case of the youngest, of which, seven were cold." The fever in both was completely subdued: on the morning of the third day they were evidently safe; and on the morning of the fourth day, they were both convalescent. The term tepid is here applied to water from 87° to 97° of the scale of Fahrenheit, and that of cool from 87° to 75°; and the temperature of the water used in affusion is increased inversely as that of the heat of the body decreases.

Numerous communications from various practitioners in the West and East Indies, in Egypt, and America, also shew the efficacy of affusion in the raging fevers of hot countries. We may therefore, indulge some hope, perhaps, that even the plague and the yellow fever, if judiciously combated in their incipient stages, may be made to yield to this simple but all-powerful remedy.

Many practitioners complain of the difficulty of persuading their patients to submit to the cold affusion. This difficulty, Dr. Currie says, will soon disappear, " if, before the remedy is proposed, the practitioner shall have first decided in his own mind on its propriety; and in recommending it, shall exhibit that calmness and confidence with which every remedy, and especially a new and an appa-

rently bold one, should be proposed to a patient whose mind is weakened by disease. Every arrangement should also be made for the affusion before the patient is moved at all, and much fatigue, as well as disquiet, should be particularly avoided. And, after all, the tepid affusion may be substituted for the more powerful remedy, in cases where the delicacy of the system, or the apprehensions of the patient, or of the bye-standers, prevent the other from being employed."

COLEWORT. See BRASSICA.

COLICA, (κωλικη; from κωλον, *the colon*, one of the large intestines); the COLIC. This genus of disease, which includes three species, is arranged by Cullen in the class *neuroses*, and order *spasmi*.

The colic is chiefly known by a violent pain in the abdomen, commonly about the umbilical region. The pain resembles various kinds of sensations, as of burning, twisting, boring, a ligature drawn very tight, &c. The belly is generally costive, though sometimes there is a violent evacuation of bilious matter upwards and downwards. In these cases the disease is sometimes accompanied, from the beginning, with a weak, and intermitting pulse, cold sweats and fainting. In some the disease comes on gradually, beginning with an habitual costiveness; and if purgatives be taken, they do not operate. The pain comes on generally after a meal, and soon occasions nausea and vomiting. Sometimes the disease is attended with pyrexia, violent thirst, and a full pulse; the vomiting becomes more violent, and excrementitious matters are thrown up, with the most exquisite pain and tension of the abdomen; an hiccup comes on, which continues obstinately; till at last a cessation of pain and fœtid breath indicate a mortification of the intestines, and approaching death. Sometimes the peristaltic motion of the intestines is so totally inverted, that all their contents are evacuated by the mouth, and even clysters will be vomited; which constitutes that disease commonly called the *iliac passion*.

Colics may arise from any sudden check given to perspiration, as by violent cold applied to any part of the body, especially to the lower extremities and abdomen. Very frequently they are occasioned by austere, acid, or indigestible aliments taken into the stomach. By any of these, a violent colic, or indeed an iliac passion, may be occasioned: for Dr. Cullen justly observes, that this last, though commonly counted a different species of disease, differs from a colic in no other way than in being, in every respect, in a much higher degree. In those who have died of this disease and been dissected, the intestines have sometimes been found twisted; but more commonly there has been an *introsusception* of the intestine, that is, one part of the gut seems to have entered within the other. In the Edinburgh Medical Essays, vol. iii. we have a dissertation on the use of the warm bath in the bilious colic, in which the author derives the disorder from a spasmodic constriction of the intestine, occasioned by the acrimony of the bile. By this, he says, the intestine is not only contracted into an unusual narrowness, but its coats have been found, upon dissection, so closely joined, that no passage could be made downwards, more than if they had been strongly tied by a ligature. See INTROSUSCEPTIO, and ILIACA PASSIO.

Dr. Smith says, the *flatulent* and *inflammatory* colic are readily enough to be distinguished from each other:—In the flatulent colic the pain comes on by fits, flies from one part of the bowels to another, and is much abated by a discharge of wind either upwards or downwards; but in the inflammatory colic the pain remains equable, and fixed and settled in one spot; the vomitings are severe, and frequently bilious, the belly is obstinately bound, and the pulse quick and feverish.

The colic is never to be reckoned void of danger, as it may unexpectedly terminate in an inflammation and gangrene of the intestines. Those species of it which are attended with purging must be considered as much less dangerous than those in which the vomiting is very violent. The iliac passion, or that attended with the vomiting of fæces, is always to be accounted highly dangerous; but if the passage through the intestines be free, even though their peristaltic motion should be inverted, and clysters evacuated by the mouth, there is much more hope of a cure, than when the belly is obstinately costive, and there is some fixed obstruction which seems to bid defiance to all remedies.

In treating the spasmodic colic, we are to consider, that the recovery must ultimately depend on producing a resolution of the spasmodic affection. In order to accomplish this, it is in general necessary to evacuate the contents of the intestines, and to remove morbid irritability existing in that part of the system. But in order to preserve the life of the patient from the most imminent hazard, it is still more necessary to prevent and remove those inflammatory affections which often occur in this disease. As the chief danger in colics arises from an inflammation and consequent mortification of the intestines, it is essentially necessary, in the first place, to diminish the tendency to a pyrexia, if there should happen to be any. This is accomplished by bleeding, emollient injections, warm bathing, and cooling medicines taken inwardly. Dr. Porter, in his essay on this disease, strongly recommends the warm bath in those colics attended with violent evacuations of bile. He supposes it to do service by relaxing the constriction of the intestines, and thus preventing or removing the introsusception. In the mean time opiates may be given to ease the pain, while every method is tried by cathartics and clysters of various kinds, to procure a stool. In obstinate cases, where stimulating

cathartics have proved ineffectual, the milder kinds, such as manna, senna, oleum ricini, &c. will probably succeed.

Dr. Smith says, the flatulent or *spasmodic* colic is to be relieved by the warm cathartic and antispasmodic or carminative medicines, and cupping-glasses to the abdomen.

℞ Tinct. rhabarb.
Aq. cinnam. aa ℥j.
Tinct. aromatic. ʒj.
Misce fiat Haust.

℞ Aq. piment. ℥vj.
Sp. cinnam. ℥ij.
Tinct. fœtid. ʒij.
Syr. papav. err. ℥ss.
Misce fiat Julep. sumend. coch. iij. subinde.

℞ Lact. assæ fœtid. ℥viij.
Tinct. opii ʒj. M.
Pro enemate hora somni injiciatur.

Sometimes, in an hysterical or hypochondriacal patient, a purging and vomiting will likewise come on; in this case, a warm opiate will answer every intention.

℞ Confect. opiat. ℈j.
Rhabarb. gr. vj.
Pulv. aromatic. gr. iij.
Bals. Peruv. q. s. ut ft. Bol. repetend. ut opus erit.

The colic from irritation may be remedied by gentle cathartics, joined with opiates.

℞ Mannæ ℥ss.
Solve in Aq. fontan. ℥jss.
Adde Ol. amygd. ʒiij.
Tinct. opii gtt. x.
Tinct. aromatic. ʒj.
Misce fiat Haust. sexta quaque hora sumend.

Where every thing of this kind fails, practitioners usually have recourse to some of the more extraordinary methods. Some have recommended the swallowing of leaden bullets, on a supposition that, by their weight, they would force through the obstruction into the gut; but these seem much more likely to create than to remove an obstruction. It is impossible they can act by their gravity, because the intestines do not lie in a straight line from the pylorus to the anus; and though this were actually the case, we cannot suppose that the weight of a leaden bullet could prove very efficacious in removing either a spasmodic constriction or an obstruction from any other cause. But when we consider, not only that the intestines consist of a great multitude of folds, but that their peristaltic motion (by which only their contents are forced through them) is inverted, the futility of this remedy must be evident. It might rather be supposed to aggravate the disease; as the lead, by its pressure, would tend to fix the introsusception more firmly, or perhaps push it still further on. The same thing may be said of quicksilver; not to mention the pernicious consequences to be apprehended from swallowing large quantities of this mineral, even if it should prove efficacious in relieving the patient for the present. There are, however, some few cases on record, particularly one by Mr. William Perry, published in the sixteenth volume of the Edinburgh Medical Commentaries, in which the hydrargyrus, swallowed in great quantities, was attended with the happiest effects, after every other remedy had been tried.

Another method has been proposed, in the Medical Essays, for relieving the miserable patients in this disorder, which in many cases has been known to do service. The patient is to be taken out of bed, and made to walk about on the cold floor of a damp apartment. At the same time, porringers of cold water are to be dashed on his feet, legs, and thighs; and this must be continued for an hour or longer, if a stool be not procured before that time, though this will generally be the case much sooner. The exercise does not at all impair the patient's strength, but rather adds to it; and some very remarkable instances are adduced in the sixth volume of the Medical Essays, where this proved effectual after all other medicines had failed. In one person the disease had come on with an habitual costiveness, and he had been for a week tormented with the most violent pain and vomiting, which could be stopped neither by anodynes nor any other medicines; the sharpest clysters being returned unaltered, and all kinds of purgatives being thrown up soon after they were swallowed; but by the above-mentioned method, a stool was procured in thirty-five minutes, and the patient recovered. In some others the costiveness continued for a much longer time. Other remedies are, the blowing air into the intestines by means of bellows, and the injecting clysters of the smoke of tobacco. But neither of these seem very capable of removing the disease. They can affect only the parts below the obstruction; while, to cure the disease, it is necessary that the obstructed parts themselves should be reached by the medicine, and therefore we have not many well-attested instances of their success. In some obstinate cases, however, benefit has certainly been derived from tobacco-smoke injections, and likewise from injections of tepid water to the extent of several pounds. When every other remedy has failed, a *constant stream* of this, thrown up the rectum, has succeeded. For putting in practice these modes of

cure, a particular apparatus has been contrived; and in cases even apparently desperate, neither should be neglected. The cold water applied to the skin, gives a general and very considerable shock to the system, checks the perspiration, and thus drives the humours inward upon the intestines, by which they receive a much more effectual stimulus than can be supposed to arise from any kind of clyster. But when all methods have failed, the only chance the patient can have for life is by a surgical operation.

In those colics which are attended with faintings, &c. from the beginning, and which generally attack debilitated persons, all kinds of evacuations are pernicious; and the cure is to be attempted by anodynes and cordials, which will seldom fail of success. Even there also, however, it is necessary that the belly should be moved; and for this purpose, injections, containing a solution of assafœtida, which operate powerfully as antispasmodics, are preferable to most other modes of cure.

COLICA PICTONUM; *the Colic of Poictou.* This is the *Rachialgia Pictonum.* or *metallica*, of *Sauvages.* Violent colics are frequently found to be occasioned by lead received, without being suspected, into the body. To this cause is owing the colics to which plumbers, lead-miners, and smelters of lead, are subject. To the same cause, though not so apparent at first sight, are we to ascribe the *Devonshire colic*, leaden vessels being used to convey or contain the cider, which is the common drink of the inhabitants of that county. The *dry belly-ach* of the West Indies, is also of the same nature; for which reason the following general description of the symptoms may apply to each.

The patient is generally first seized with an acute pain at the pit of the stomach, which extends itself down, with griping pains, to the bowels. Soon after there is a distension as with wind; and frequent reachings to vomit, without bringing up any thing but small quantities of bile and phlegm. An obstinate costiveness follows, yet sometimes attended with a tenesmus, and the bowels seem to the patient as if they were drawn up towards the back; at other times they are drawn into hard lumps, or hard rolls, which are plainly perceptible to the hand on the belly, by strong convulsive spasms. Sometimes the coats of the intestines seem to be drawn up from the anus, and down from the pylorus towards the navel. When a stool is procured by artificial means, as clysters, &c. the fæces appear in little hard knots, like sheep's dung, called *scybalæ*, and are in small quantity. There is, however, usually an obstinate costiveness; the urine is discharged in small quantity, frequently with pain and much difficulty. The pulse is generally low, though sometimes a little quickened by the violence of the pain: but inflammatory symptoms very seldom occur.—The extremities are often cold, and sometimes the violence of the pain causes cold clammy sweats and fainting. The mind is generally much affected, and the spirits are sunk. The disease is often tedious, especially if improperly treated, insomuch that the patients will continue in this miserable state for twenty or thirty days successively: nay, instances have been known of its continuing for six months. In this case, the pains at last become almost intolerable: the patient's breath acquires a strong fœtid smell, as of excrement, from a retention of the fæces, and an absorption of the putrid effluvia from them by the lacteals. At last, when the pain in the bowels begins to abate, a pain comes on in the shoulder-joint and adjoining muscles, with an unusual sensation and tingling along the spinal marrow. This soon extends itself from thence to the nerves of the arms and legs, which become weak; and that weakness increases till the extreme parts become paralytic, with a total loss of motion, though a benumbed sensation often remains. Sometimes, by a sudden metastasis, the brain becomes affected, a stupor and delirium come on, and the nervous system is irritated to such a degree as to produce general convulsions, which are frequently followed by death. At other times the peristaltic motion of the intestines is inverted, and a true iliac passion is produced, which also proves fatal in a short time. Sometimes the paralytic affection of the extremities goes off, and the pain of the bowels returns with its former violence; and on the cessation of the pain in the intestines, the extremities again become paralytic, and thus the pain and palsy will alternate for a very long time.

Various methods have been attempted for removing this terrible disease. The obstinate costiveness which attends it made physicians at first exhibit very strong purgatives and stimulating clysters. But these medicines, by increasing the convulsive spasms of the intestines, were found to be pernicious. Balsam of Peru, by its warm aromatic power, was found to succeed much better; and Dr. Sydenham accordingly prescribed it in the quantity of forty drops twice or thrice a-day, taken on sugar. This, with gentle purgatives, opiates, and some drops of the hotter essential oils, continued to be the medicines commonly employed in this disease, till a specific was published by Dr. Lionel Chalmers, of South Carolina. This receipt was purchased by Dr. Chalmers from a family where it had long been kept a secret. The only unusual medicine employed, and on which the efficacy of it chiefly if not wholly depends, is vitriolated copper. It is prepared in the following way:

℞ Cupri vitriolat. gr. viij.
Aquæ distillatæ ℥viij.
Misce fiat solutio.

The dose is a wine-glassful, given fasting, for nine successive mornings. For the first four or

five days, this medicine discharges much æruginous bile both ways: but the excretions of this humour lessen by degrees; and before the course be ended, it has little other effect than to cause some degree of squeamishness, or promote a few bilious stools, or perhaps may not move the patient at all. At the time of using this medicine, the patient should live upon broth made of lean meat, gruel, or panada: but about the seventh or eighth day, he may be allowed bread and boiled chicken. Here the copper seems to do service by its tonic power; and, for the same reason, alum, recommended by Dr. Percival, most probably, cures the disease. He says he has found this very efficacious in obstinate affections of the bowels, and that it generally proves a cure in the slighter cases of the colica pictonum. It was given to the quantity of fifteen grains every fourth, fifth, or sixth hour; and the third dose seldom failed to mitigate the pain, and sometimes entirely removed it. Among purgative medicines, the *oleum ricini* is found to be the most efficacious, especially when formed into an emulsion, with distilled water, and *aqua kali* or volatile alkali.

COLLATERA'LES. So Spigelius calls the erectores penis, from their collateral order of fibres.

COLLEGE OF PHYSICIANS, a corporation of physicians. That in London, by several charters and acts of parliament of Henry VIII. and his successors, enjoys certain privileges, whereby no man, though a graduate in physic of any university, may, without licence under the said college-seal, practise physic in or within seven miles of London. They can also administer oaths, fine and imprison offenders in that and several other particulars; and search the apothecaries shops, &c. in and about London, to see if their drugs, &c. be wholesome, and their compositions according to the form prescribed by the said College in their dispensatory. By their charter they are also freed from all troublesome offices, as serving on juries, being constables, keeping watch, providing arms, &c.

The society had anciently a College in Knight-rider-street, the gift of Dr. Linacre, physician to king Henry VIII. Since that time they also had a house built for them by the famous Dr. Harvey in 1652, at the end of Amen-corner, which he endowed with his whole inheritance in his life-time: but this being burnt in the great fire in 1666, a new one was erected, at the expence of the fellows, in Warwick-lane, with a noble library, given partly by the marquis of Dorchester, and partly by Sir Theodore Mayerne.

Of this College there are at present, a president, four censors, eight electors, a register, and a treasurer, chosen annually in October; the censors have, by charter, power to survey, govern, and arrest all physicians, or others practising physic, in or within seven miles of London; and to fine, amerce, and imprison them, if offending. The number of fellows was anciently thirty, till king Charles II. increased their number to forty: and king James II. giving them a new charter, allowed the number of fellows to be enlarged so as not to exceed fourscore; reserving to himself and successors the power of placing and displacing any of them for the future.

A College of Physicians was also erected in Edinburgh, on the 29th November 1681. The design of this institution was, to prevent the abuses daily committed by foreign and illiterate impostors, quacks, &c. For this reason, king Charles II., at the time abovementioned, granted letters patent to erect into a body corporate and politic, certain physicians in Edinburgh and their successors, by the title of "the President and Royal College of Physicians of Edinburgh," with power to choose annually a council of seven, one whereof to be president; these are to elect a treasurer, clerk, and other officers; to have a common seal; to sue and to be sued: to make laws for promoting the art of physic, and regulating the practice thereof, within the city of Edinburgh, town of Leith, and districts of the Canongate, West-port, Pleasance, and Potter-row; through all which their jurisdiction extends. In Dublin, a similar institution has existed many years.

COLLEGE OF SURGEONS. About twenty years ago, the surgeons of Edinburgh were incorporated into a *Royal College*, and also authorized to carry into execution a scheme for making provision for their widows and children &c. an institution which has proved of the greatest utility. They have also the privilege of examining, and licensing if found qualified, all practitioners in surgery within certain bounds. A similar foundation, under the title of the *Royal College of Surgeons of London*, has also, very lately, been established by Act of Parliament. The plan of this is somewhat different from that of Edinburgh, though, with the exception of the eleemosynary part, professing the same objects. The president and council of this College annually confer premiums on the writers of the best Essays on subjects previously advertised; public lectures also form a part of their plan; and they are now possessed of the late Mr. Hunter's celebrated collection of anatomical and other preparations. There is also a College of Surgeons in Dublin, exercising similar powers.

COLLE'TICA, (from κολλα, *glue*); conglutinating medicines.

COLLI'CIÆ; the union of the ducts which convey the humours of the eyes from the puncta lachrymalia to the cavity of the nose.

COLLINSO'NIA, a genus in Linnæus's botany. There is only one species.

COLLIQUAME'NTUM, a term first made use of by Dr. Harvey, in his application of it to the first rudiments of an embryo in generation.

COLLIQUATIVE, (from *colliqueo*, to melt or waste away); an epithet applied to those inordinate

secretions which are the effect of mere debility. Thus a purging which mostly takes place in phthisis, consuming the strength of the patient very rapidly and generally, alternating with profuse perspirations, is termed *colliquative.*

COLLISION, (from *collido*, to slide together, or against one another); such a motion of two or more bodies, as is in contrary direction, whereby they meet and clash, so as, perhaps, to break off some part of each other.

COLLUTO'RIUM, (from *colluo*, to wash), a fluid medicine which is used as a wash for the mouth. It is synonimous with GARGLE.

COLLY'RIUM, (from κωλυω, *to check*, and ρυς, *a defluxion).* Any medicine was formerly so called, which was applied with that intention. But the term is now only given to fluid applications for the eyes, or *eye-waters*, as they are familiarly called. Various examples occur in the article OPHTHALMIA.

COLLY'RIUM SAMIUM, brown Samian earth. It is of a marly kind: there is also a white sort.

COLOBO'MA, (κολοβωμα, from κολοβοω, *to maim);* the growing together of the eyelids.

COLOCA'SIA, great Egyptian arum, a species of ARUM. It is also a name of the Egyptian bean.

COLOCY'NTHIS, (κολοκυνθις; from κωλον, *the colon*, and κινεω, *to move;* because of its great purging powers), coloquintida, or BITTER-APPLE. This plant, the *Cucumis colocynthis; foliis multifidis, pomis globosis glabris*, Linn. is of the gourd kind, and grows in Turkey. The fruit is about the size of an orange: its medullary part, freed from the rind and seeds, is alone made use of in medicine: this is very light, white, spongy, composed of membranous leaves; of an extremely bitter, nauseous, acrimonious taste. Colocynth is one of the most powerful and most violent cathartics. Many eminent physicians condemn it as dangerous, and even deleterious: others recommend it, not only as an efficacious purgative, but likewise as an alterative in obstinate chronical disorders. Thus much is certain, that colocynth, in the dose of a few grains, acts with great vehemence, disorders the body, and sometimes occasions a discharge of blood. Many attempts have been made to correct its virulence by the addition of acids, astringents, and the like; these may lessen the force of the colocynth. but no otherwise than might be equally done by a reduction of the dose. *The best method of abating its virulence, without diminishing its purgative virtue, seems to be by triturating it with gummy farinaceous substances*, or the *oily seeds*, which, without making any alteration in the colocynth itself, prevent its resinous particles from cohering and sticking upon the membranes of the intestines, so as to irritate, inflame, or corrode them. It is an ingredient in the *Pil. alo. cum. colocynth.* Edin. See ALOES. The London College directs the following:

Extractum Colocynthidis Compositum. Lond.

Take of the Pith of coloquintida, cut small, six drachms;
Socotorine aloes, in powder, an ounce and a half;
Scammony, in powder, half an ounce;
Less cardamom seeds, husked and powdered, one drachm;
Proof spirit, one pint.

Digest the coloquintida in the spirit, with a gentle heat, for four days. To the expressed tincture add the aloes and scammony; when these are dissolved, draw off the spirit by distillation, and evaporate the water, adding the seeds towards the end of the process, so as to form an extract fit for making pills.

COLO'MBA; otherwise named, by different writers, *Columbo*, *Calomba*, or *Colombo*. The root so called has only of late years been introduced into the materia medica. The natural history of it is not yet well known; but the plant which affords it, is said, by Wildenow, to be a species of *Bryonia.* This root, we are told, comes to us from Columbo, a town in Ceylon, in circular pieces, which are from half an inch or an inch to three inches in diameter; and divided into *frusta*, which measure from two inches to one quarter of an inch. From more recent accounts, however, we learn, that it is produced in Africa, in the country of the *Caffres*, and that it forms an important article of commerce with the Portuguese, at Mosambique, in the province of Tranquebar. The sides of this root are covered with a thick corrugated bark, of a dark brown hue on its external surface, but internally of a light yellow colour. From Dr. Percival's experiments on this root, it appears, that rectified spirit of wine extracts its virtues in the greatest perfection. The watery infusion is more perishable than that of other bitters. An ounce of the powdered root, half an ounce of orange peel, two ounces of brandy, and 14 ounces of water, macerated 12 hours without heat, and then filtered through paper, afford a sufficiently strong and tolerably pleasant infusion. The extract made first by spirit and then with water, and reduced by evaporation to a pilular consistence, is found to be equal if not superior in efficacy to the powder. As an antiseptic, Columbo-root is inferior to the bark; but as a corrector of putrid bile, it is much superior to the bark; whence also it is probable, that it would be of service in the West India yellow fever. It also restrains alimentary fermentation, without impairing digestion; in which property it resembles mustard. It does not appear to have the least heating quality; and therefore may be used in phthisis pulmonalis, and in hectic cases, to strengthen digestion. It occasions no disturbance, and agrees very well with a milk diet, as it abates flatulence, and is in-

disposed to acidity. The London, Edinburgh, and Dublin Colleges direct a tincture of the Colombo-root.

Tinctura Columbæ. Lond.

Take of Colombo, in powder, two ounces and an half;
Proof spirit of wine, two pints.
Digest them for eight days, and strain the tincture.

The virtues of the columbo are possessed in a great degree by this menstruum, so as to render it a medicine of much effect; and it may be depended upon where the root is useful: but the root itself, in powder, is more eligible, where no circumstances occur to prohibit its exhibition.

CO'LON, (κωλον; from κοιλοο, *hollow;* because it is generally found empty in the dead body); the second portion of the large intestines, of which it is the most considerable of all. From the cæcum, of which it is a continuation (see Cæcum) it reaches, in an arched form, above the umbilical region, and to the lower part of the left hypochondrium. Its continuity is, however, a little interrupted by the ileum, which advances into the cavity of the colon, and, together with a certain fold of that intestine, forms what is called *valvula coli.*

The whole convex side of the colon is divided longitudinally into three parts, by three muscular bands, first known to Sylvius and Eustachius, continued from, and of the same structure with, those of the cæcum. Two of these bands run on each side along the great curvature, and the third along the small curvature, of the colon. The uppermost band, of the two that belong to the great curvature, is the broadest; that which belongs to the small curvature is the narrowest; and by the connection of the mesocolon, it remained undiscovered, till brought to light by Morgagni. These three bands do the office of longitudinal fræna, between which this intestine is, through its whole length, alternately depressed into transverse folds, and raised into considerable eminences. All the folds are duplicatures, which form portions of *valvulæ conniventes* in the cavity of the intestine; and the eminences form receptacles, called the *cells of the colon.*

All the coats of the intestinum colon concur equally to the formation of these duplicatures and cells, the depth of which decreases gradually toward the extremity of the intestine, and neither of them go any further than the ligamentary bands. These portions of the colon which are immediately covered by the ligamentary bands, are smooth, and without rugæ; and therefore, if these bands alone are cut across, the intestine is not sufficiently elongated to destroy all the folds and cells.

The common coat, on one side, is a continuation of the mesocolon; and on the other side, it contributes, by the same continuation, to form the omentum. The longitudinal fibres of the muscular coat are very slender, except in the bands already mentioned; and those which answer to the annular fibres of the small intestines, are only segments stretched over the eminences and folds. The other coats are nearly as in the cæcum; only the glandular lacunæ, or solitary glands, are broader and more numerous.

The *arch of the colon* begins under the right kidney; runs up on the foreside of that kidney, to which it is connected; passes under the gall-bladder, which tinges it with a yellow colour at that place; and continues its course before the first incurvation of the duodenum, to which it adheres, and partly hides it. In this part of its course, therefore, there is a remarkable connection between the colon, duodenum, right kidney, and bladder.

From that situation, the arch of the colon runs before the great convexity of the stomach, and sometimes a little lower; it then turns backward under the spleen, in the left hypochondrium; it runs down on the foreside of the left kidney, to which it is connected; below this kidney, it turns toward the vertebræ, and terminates there by a double incurvature, or by two opposite convolutions, which represent, in some measure, an inverted Roman S.

These last convolutions of the colon are sometimes multiplied, and even advance to the right side of the pelvis; and along the great arch, and the two last incurvations, are the *appendices coli adiposæ,* which we shall elsewhere explain, as also the connections of the colon with the mesocolon and omentum. At the junction of the colon with the cæcum, is the large fold which is situated within, and has been, by different anatomists, named the valve of the ileum, of the cæcum, and of the colon. See Valvula Coli.

COLOQUI'NTIDA. See Colocynthis.

COLO'STRUM, or Colostra, the first milk secreted in the breasts of a woman after delivery. Bartholine applies the term, figuratively, to an emulsion, made by the solution of turpentine with the yolk of an egg.

COLOUR, in physics, a property inherent in light, by which, according to the various sizes of its parts, or from some other cause, it excites different vibrations in the optic nerve; which, propagated to the sensorium, affect the mind with different sensations. Though, of all sensible qualities, colour is the least useful in ascertaining the virtues and powers of vegetables; yet, as the following general positions have been laid down on this subject, by Linnæus, and as they appear to be sufficiently attested by experience, they do not deserve to be overlooked. A *yellow* colour, he says, generally indicates a bitter taste, as in gentian, aloes, celandine, turmeric, and other yellow flowers.

Red denotes an acid or sour taste; as in cranberries, barberries, currants, raspberries, mulberries, cherries, the fruit of the rose, sea-buckthorn, and service-tree. Herbs that turn red towards autumn, have also an acid taste; as sorrel, wood-sorrel, and bloody dock. *Green* indicates a crude, alkaline taste, as in leaves and unripe fruits. A *pale* colour denotes an insipid flavour, as in endive, asparagus, and lettuce. *White*, promises to be sweet and luscious to the palate; as in white currants, and plums, sweet-apples, &c. Lastly, *black* indicates a harsh, nauseous, and disagreeable taste; as in the berries of deadly night-shade, myrtle-leaved sumach, herb-christopher, and others; many of which are not only unpleasant to the taste, but pernicious and fatal in their effects.

COLTSFOOT. See TUSSILAGO.

CO'LUBER BE'RUS, (*Coluber, quod colit umbram*, because it delights in shade); the systematic name of the viper. See VIPERA.

COLUBRI'NA VIRGINEA'NA. See SERPENTARIA.

COLUBRI'NUM LIGNUM, (from *coluber*; so called from the snake-like contortions of its roots). This species of snake-wood is brought from America. It is solid, ponderous, acrid, extremely bitter, and inodorous; its bark is of a ferruginous colour, covered with cineritious spots.

CO'LUM, a term used for a strainer of liquids, as *cribrum* is of solids.

COLUMBINE. See AQUILEGIA.

COLU'MBO. See COLOMBO.

COLUME'LLA, (dim. of *columa*, a column). See the articles UVULA, and CLITORIS.

COLU'MNA NA'SI, is that fleshy part of the nose which is prominent in the middle

COLU'MNÆ CA'RNEÆ. See HEART.

COLUMNE'LLA, in botany, a little column; the membranaceous substance which connects the internal partitions with the seed, in that species of seed-vessel termed capsule.

COLUMNIFERÆ, (from *columna*, a pillar, and *fero*, to bear), in botany, the 37th order in Linnæus's Fragments of a Natural Method. It consists of plants whose stamina and pistil have the appearance of a column or pillar in the centre of the flower. This order furnishes plants very different in their size and height, from the creeping mallows, and low shrubby tea-tree, to the fleshy limes, and the more lofty silk-cotton-trees, which by some modern writers are affirmed to be so large as not to be fathomed by sixteen men, and so tall that an arrow cannot reach their top. The genera are numerous.

CO'MA, (κομα, from κω, or κεω, *to lie down*), also called *Coma-vigil;* a preternatural propensity to sleep; when, nevertheless, the patient does not sleep, or if he does, awakes immediately without any relief. See APOPLEXIA.

CO'MA SOMNOLE'NTUM, is when the patient continues in a profound sleep; and, when awakened, immediately relapses, without being able to keep open his eyes.

CO'MA, in botany; the top of a branch, or flower, or plant, or of the leaves of trees.

CO'MARUM, MARSH-CINQUEFOIL; a genus in Linnæus's botany. He enumerates one species.

CO'MATA, (κωματα; from κωμα); a diminution of the powers of voluntary motion, with sleep, or the senses impaired. It is the first order of the Class *neuroses* in Dr. Cullen's nosology. To this order the genus Apoplexia belongs. See APOPLEXIA.

COMATOSE; having a strong propensity to sleep. See COMA.

COMBINATION, in chemistry, signifies the union of two bodies of different natures, from which a new compound body results. For example, when an acid is united with an alkali, we say that a combination betwixt these two saline substances takes place; because, from this union a neutral salt results, which is a new substance, differing from those that are composed of an acid and an alkali.

COMBU'STIO, (from *comburo*, to burn); a burn or scald. See BURN.

COMBUSTION, (from *comburo*, to burn), a decomposition of such substances as are capable of the separation of their parts by the action of fire. Lavoisier's theory of combustion is founded upon the absorption of oxygen by a combustible body. It is well known to chemical philosophers, that bodies cannot burn in a limited quantity of air beyond a certain period; and that cumbustion is not confined to the decomposition of the atmosphere only, by absorbing one of its principles; but that it also decomposes oxygen gas, by absorbing, fixing, and rendering more or less solid, in the combustible body, the oxygen or basis of the oxygen gas, and disengaging its solvent, the caloric, under the appearance of heat and flame.

"Taking this for granted, it follows," says Mr. Accum, "that combustion is only the play of affinity between oxygen, the matter of heat, and a combustible body. When an *incombustible* body, a brick for instance, is heated, it undergoes no change except an augmentation of bulk aud temperature, and when left to itself it soon regains its former state. But when a *combustible* body is heated to a certain degree in the open air, it begins to become most intensely hot, and at last emits a copious stream of caloric and light, to the surrounding bodies. During this emission, the burning body gradually wastes away. It either disappears entirely, or its physical properties become totally altered. The principal change it suffers, is that of being no longer capable of combustion.

"If either of these phenomena, namely, the emission of heat and light, and the waste of sub-

stance, be wanting, we do not say that a body is undergoing combustion, or that it is burning. It follows, therefore, that every theory of combustion ought to explain the following facts: 1. Why a burning body is consumed, and its individuality destroyed. 2. Why, during the progress of this alteration, heat and light are emitted."

For the elucidation of these points, Lavoisier has laid down the following laws: he says, 1. Combustion cannot take place without the presence of oxygen, and is more rapid in proportion to the quantity of this agent in contact with the inflamed body. 2. In every act of combustion the oxygen present is consumed. 3. The weight of the products of every body after combustion, corresponds with the weight of the body before combustion, *plus* that of the oxygen consumed. 4. The oxygen absorbed by the combustible body, may be recovered from the compound formed, and the weight regained will be equal to the weight which disappeared during the combustion. 5. In every instance of combustion, light and heat or fire, are liberated. 6. In a limited quantity of air, only a certain quantity of the combustible body can be burnt. 7. The air, wherein a body has been burnt, is rendered unfit for maintaining combustion, or supporting animal life.

But though, in every case of combustion, it is requisite that light and heat should be evolved, yet this process proceeds very differently in different circumstances: hence have resulted the terms *ignition*, or glowing heat; *inflammation* or ascension; and *detonation* or explosion. See IGNITION, &c.

COME'DONES. See CRINONES.

COME'TES, a genus in Linnæus's botany. There is but one species.

COMFRY. See SYMPHITUM.

COMI'NIA, a species of RHUS.

COMMELI'NA, a genus in Linnæus's botany. There are nine species.

COMMERSO'NIA, a genus in Linnæus's botany. There is but one species.

COMMINU'TION, (from *comminuo* to break, or shiver to pieces), in pharmacy, the reduction of any solid body into finer particles, as in pulverization.

COMMISSU'RA, (from *committo*, to join together), a commissure. This term is applied, in anatomy, to the corners of the lips, where they meet together; and also to certain parts of the brain which go across from one hemisphere to the other.

COMMISSU'RA ANTERIOR CEREBRI; an appellation given to the nerve-like substance which crosses the anterior part of the third ventricle of the brain, immediately above the infundibulum, and between the anterior crura of the fornix; uniting one hemisphere of the brain with the other.

COMMISSU'RA MAGNA CEREBRI; a term for the *corpus callosum* of the brain.

COMMISSU'RA POSTERIOR CEREBRI; the nerve-like substance, which passes from one hemisphere of the brain to the other, immediately over the opening of the aquæduct of Sylvius. It is situated in the posterior part of the third ventricle of the brain, and above the *corpora quadrigemina*.

COMO'SÆ, (from *coma*, hair), in botany, an order of plants in the former editions of Linnæus's Fragments of a Natural Method, consisting of the spiked-willow or spiræa frutex, dropwort, and greater meadow-sweet. These, though formerly distinct genera, are by Linnæus collected into one, under the name of *spiræa*. The flowers growing in a head, resemble a bush, or tuft of hair, which probably gave rise to the epithet *Comosæ*.

COMPARATIVE ANATOMY, or Zootomy; the dissection of animal bodies to compare them with the human. See ZOOTOMY.

COMPLE'TUS FLOS. In botany, a flower is said to be *complete*, which is provided with both the covers, viz. the calyx, or flower-cup, and the petals. The term was invented by Vaillant, and is synonymous to *calyculatus flos* in Linnæus. Berkenhout erroneously confounds it with the *auctus* and *calyculatus calyx* of the same author.

COMPLEXION, a term technically denoting the temperament, habitude, and natural disposition, of the body; but, popularly, signifying the colour of the face and skin. Few subjects have engaged the attention of naturalists more than the diversities among the human species, among which that of colour is the most remarkable. The great differences in this respect have given occasion to several authors to assert, that the whole human race have not sprung from one original; but that as many different species of men were at first created as there are now different colours to be found among them. It remains, in reality, a matter of no small difficulty to account for the remarkable variations of colour that are to be found among different nations. Dr. Hunter, who considered the matter more accurately than has commonly been done, determines absolutely against any specific difference among mankind. He introduces his subject by observing, that when the question has been agitated, whether all the human race constituted only one species or not, much confusion has arisen from the sense in which the term *species* has been adopted. He therefore thinks it necessary to set out with a definition of the term. He includes under the same species all those animals which produce issue capable of propagating others resembling the original stock from whence they sprung. This definition he illustrates by having recourse to the human species as an example. And in this sense of the term he concludes, that all of them are to be considered as belonging to the same species. And as, in the case of plants, one species comprehends several varieties depending upon cli-

mate, soil, culture, and similar accidents; so he considers the diversities of the human race to be merely varieties of the same species, produced by natural causes. For the reasons assigned by physiologists for the variations of *colour* in the human skin, see SKIN and RETE MUCOSUM.

Upon the whole, colour and figure may be styled habits of the body. Like other habits, they are created, not by great and sudden impressions, but by continual and almost imperceptible touches. Of habits, both of mind and body, nations are susceptible as well as individuals. They are transmitted to the offspring, and augmented by inheritance. Long in growing to maturity, national features, like national manners, become fixed only after a succession of ages. They become, however, fixed at last; and if we can ascertain any effect produced by a given state of weather or of climate, it requires only repetition during a sufficient length of time, to augment and impress it with a permanent character. The sanguine countenance will, for this reason, be perpetual in the highest latitudes of the temperate zone; and we shall for ever find the swarthy, the olive, the tawny, and the black, as we descend to the south. These observations have been well recapitulated and enforced by the Rev. Doctor Smith, professor of moral philosophy in the college of New Jersey, in his *Essay on the Causes of the Variety of Complexion and Figure in the Human Species*; to which the reader is referred.

COMPLEXUS, (from *complector*, to comprise), the name of a muscle situated on the back part of the neck, that draws the head backwards, and to one side; and when both act, they draw the head directly backward. It arises from the transverse processes of the seven superior vertebræ of the back and four inferior of the neck, by as many distinct tendinous origins; in its ascent it receives a fleshy slip from the spinous process of the first vertebra of the back: from these different origins it runs upwards, and is every where intermixed with tendinous fibres. It is inserted, tendinous and fleshy, into the inferior edge of the protuberance in the middle of the os occipitis, and into a part of the curved line that runs forward from that protuberance.

COMPLICATION, or COMPLICATION OF DISEASES, is when a patient labours under many distempers at a time, and more especially if they have any affinity to one another; as the dropsy, asthma, and jaundice, which frequently happen together.

COMPOSITÆ, in botany, the name of a class in Hermannus and Royen; as likewise of an order in Linnæus's Fragments of a Natural Method. It consists, in general, of the plants which have the characters enumerated in the COMPOSITUS FLOS. Mention is made of this order under the article SYNGENESIA, which includes all the compound flowers.

COMPOSITION, in chemistry, is the union and combination of several substances of different natures, from which a compound body results. From this union of bodies of different natures, a body is formed of a mixed nature, which Becker and Stahl have called a *mixture*, and which may be called a *combination* or *chemical composition*, to avoid the equivocal sense of the word *mixture*. By this last, we understand only a mere apposition of parts; and which would therefore give a very false idea of chemical composition, in which a mutual adhesion takes place between the combined substances. This term, in pharmacy, denotes the art or act of mixing various ingredients together into a medicine; so that each may assist the other's virtues, supply the other's defects, or correct any ill qualities of any particular article. See PHARMACY.

COMPOSITUS FLOS, in botany, an aggregate flower composed of many *flosculi sessiles*, on a common entire receptaculum, with a common perianthium; and whose antheræ, being five in number, unite in the form of a cylinder: the flosculi are monopetalous, and under each of them is a monospermous germen. Compound flowers are either *ligulati*, *tubulosi*, or *radiati*.

COMPOUND, in pharmacy, a medicine which consists of more ingredients than one.

COMPRESS, (*compressus*, from *con* and *premo*, to press together), a bolster of soft linen rag, applied by surgeons, under a bandage, to any particular part. Compresses are often applied to sores, to promote their healing.

COMPRESSION, (from *comprimo*, to press together); a term used by surgeons to express a diseased state of the body, occasioned by something pressing on the Brain. It should be distinguished from concussion and inflammation. See CEREBRUM, and CONCUSSION.

In a fracture and depression of the cranium, our object ought to be, 1. To discover the situation and extent of the fracture. 2. To obviate the effects of the injury done to the brain, by raising or removing all the depressed parts of the bone. 3. To endeavour to complete the cure by proper dressings, and attention to the after-treatment.

When the teguments, corresponding to the injury done to the bone, are cut or *lacerated*, and, as is sometimes the case, entirely removed, the state of the fracture is immediately discovered; but when the integuments of the skull remain *entire*, even though the general symptoms of fracture be present, there is sometimes much difficulty in ascertaining it. When, however, any external injury appears, particularly a tumor from a recent contusion, attended by the symptoms already described, there can be no doubt of the existence of a fracture. But it sometimes happens, that compression exists without the smallest appearance of tumor. In such cases, the whole head ought to be shaved;

when an inflammatory spot may frequently be observed. Sometimes the place of the fracture has been discovered by the patient applying the hand frequently on or near some particular part of the head.

When the symptoms of a compressed brain are evidently marked, no time ought to be lost in setting about an examination of the state of the cranium, wherever appearances point out, or even lead us to conjecture, in what part a fracture may be situated. For this purpose an incision is to be made upon the spot through the integuments to the surface of the bone, which must be sufficiently exposed to admit of a free examination. Some authors have recommended a crucial incision; others one in form of the letter T; while many advise a considerable part of the integuments to be entirely removed. But as it is more agreeable to the present mode of practice to save as much of the skin as possible, a simple incision is generally preferred, unless the fracture run in different directions, and then the incision must vary accordingly. It will frequently happen, that a considerable part of the integuments must be separated from the skull, in order to obtain a distinct view of the full extent of the fracture; but no part of the integuments is to be entirely removed. When blood-vessels of any considerable size are divided, either before or in time of the examination, they ought to be allowed to bleed freely, as in no case whatever is the loss of blood attended with more advantage than the present. When, however, it appears that the patient has lost a sufficient quantity, the vessels ought to be secured.

After the integuments have been divided, if the skull be found to be fractured and depressed, the nature of the case is rendered evident; but even where there is no external appearance of fracture, tumor, discoloration, or other injury, if the patient continue to labour under symptoms of a compressed brain, if the pericranium has been separated from the bone, and especially if the bone has lost its natural appearance, and has acquired a pale white or dusky yellow hue, the trepan ought to be applied without hesitation, at the place where these appearances mark the principal seat of the injury. Again, although no mark, either of fracture or of any disease underneath, should appear on the outer table of the bone, yet there is a possibility that the inner table may be fractured and depressed. This indeed is not a common occurrence, but it happens perhaps more frequently than surgeons have been aware of; and where it does happen, the injury done to the brain is as great, and attended with as much danger, as where the whole thickness of the bone is beaten in. The application of the trepan is therefore usually deemed a necessary measure.

But if, after the application of the trepan, it happens that no mark of injury appears either in the outer or inner table in that part, or in the dura mater below it, and that the symptoms of a compressed brain still continue, a fracture in some other part is to be suspected; or that kind of fracture termed by practitioners *counter-fissure*, where the skull is fractured and sometimes depressed on the opposite side to, or at a distance from, the part where the injury was received. This is fortunately not a very frequent occurrence, and has even been doubted by some; but different instances of it have, beyond all question, been found. If therefore the operation of the trepan has been performed, and no fracture is discovered, no extravasation appears on the surface of the brain; and if blood-letting and other means usually employed do not remove the symptoms of compression, the operator is to search for a fracture on some other part. The whole head should again be examined with much accuracy; and, by pressing deliberately but firmly over every part of it, if the smallest degree of sensibility remains, the patient will shew signs of pain, either by moans or by raising his hands, when pressure is made over the fractured part. In this way, fractures have have been frequently detected, which might otherwise have been concealed.

Having here considered every thing preparatory to the operation of the trepan, we shall point out the means best adapted for the removal or elevation of a depressed portion of the bone, by the use of that instrument, under the article Trepan. After the operation, the patient should be placed in as easy a position, in bed, as possible, with his head and shoulders elevated a little more than ordinary. If the operation be attended with success, he will soon begin to show signs of increasing sensibility, and the original bad symptoms will gradually disappear. In this state, he ought to be kept as quiet as possible; proper laxatives being occasionally administered, and such as may be least of a nauseating nature. His food ought to be simple and easy of digestion, and his drink of the most diluent kind. If he complain of the wound being uneasy, an emollient poultice should be immediately applied, and renewed three or four times in the twenty-four hours. By these means there will commonly be a free suppuration from the whole surface of the sore.

Every time the *wound is dressed*, the purulent matter ought to be wiped off from it with a fine warm sponge; and if any degree of sloughiness takes place on the dura mater or parts adjacent, it will then be completely separated. Granulations will begin to form, which will continue to increase till the whole arise to a level with the surface of the cranium. The edges of the sore are now to be dressed with some mild cerate, and the rest of it covered with fine lint, kept gently pressed on it by a night-cap properly secured. In this way the cure will go on favourably; luxuriance of granulations will commonly be prevented; the parts will

cicatrize kindly; and as all the skin has been preserved in making the first incision, the cicatrix will be but little observed.

But things do not always proceed in this favourable manner. Sometimes, in a few hours after the operation, the patient is seized with a kind of restlessness, tossing his arms, and endeavouring to move himself in bed, while the symptoms of a compressed brain remain nearly the same as formerly. In this case, especially if the pulse be quick and strong, the patient ought to be bled freely, as there will be reason to suspect some tendency to inflammation in the brain. Sometimes, though the trepan has been properly applied, the symptoms are not relieved, on account of extravasated fluids collected internally under the dura mater, or between the pia mater and brain, or in the cavity of the ventricles. The danger in these cases will be in proportion to the depth of the collection. Particular attention, therefore, ought always to be paid, to the state of the dura mater after the perforation has been made. If blood be collected below the dura mater, this membrane will be found tense, dark coloured, elastic, and even livid; in which case, an opening becomes absolutely necessary to discharge the extravasated fluid. Gentle scratches are to be made with a scalpel, till a probe or directory can be introduced; upon which the membrane is to be sufficiently divided in a longitudinal, or sometimes even in a crucial, direction, till an outlet to the fluid be given.

After the dura mater has been cut in this manner, there is a possibility of the brain protruding at the opening; but the danger from this is not equal to that arising from effused fluids compressing the brain. A troublesome appearance also now and then follows the operation of the trepan; namely, the excrescences called *fungi*, (see Fungus), formerly supposed to grow immediately from the surface of the brain, but which, in general, originate from the surface of the dura mater or cut edge of the bone granulating too luxuriantly. After the wound is cured, only a small cicatrix will remain, and in general the parts will be nearly as firm as at first, but when much of the integuments have been separated or destroyed, as they are never regenerated, the bone will be left covered only by a thin cuticle, with some small quantity of cellular substance. When this is the case, the patient usually wears a piece of silver, copper, or tin, properly fitted and lined with flannel, to protect it from the cold and other external injuries.

This is the method now commonly practised in cases of compression: but it frequently happens, that instead of compression, such a degree of concussion takes place that no assistance from the trepan can be attended with any advantage; for the effects of concussion (see Concussion) are totally different from those of compression, and therefore to be removed in a different manner. In Part III. of his Surgical and Physiological Essays, Mr. Abernethy says, the degree of pressure which the brain can sustain without great injury to the system, probably may vary according to the disposition of that organ to be affected by it, the suddenness of its application, and the direction in which it is made; and although it must be very difficult to obtain any precise knowledge on this subject, yet *there is great reason to believe that the brain can bear more pressure without injury to it, than was formerly supposed.* The first of these circumstances seems evident; for, in some persons, a slight pressure produces severe symptoms; whilst in others a much greater degree is borne without inconvenience. Where a compressing cause does not, in the first instance, occasion bad effects, if inflammation of the brain ensues, it seems then to act injuriously; which probably arises from the increased susceptibility of the brain. We can rarely judge of the effects of pressure when any part of the cranium is beaten in by a blow: for in that case the shock generally occasions stupefaction. Internal hæmorrhages, perhaps, afford us the best criterion whereby to determine the effects of pressure on the brain. A case (the seventh) which Mr. Abernethy relates, sufficiently illustrates this remark, for it appears that a considerable hæmorrhage must have taken place before it deprived the patient of his faculties; since he walked home, undressed himself, and went to bed, after the trunk of the middle artery of the dura mater had been ruptured. In cases of apoplexy also, the hæmorrhage is generally very large, before it produces those consequences which destroy life.

Mr. Abernethy, on the other hand, treats of injuries of the head which imperiously demand the trephine; namely, those attended with extravasation of blood upon the dura mater. He relates three cases in which the skull was broken, and depressed at the part which covers the *middle artery of the dura mater*, by which means that vessel was *lacerated.* The attention of surgeons, he thinks, has not been sufficiently directed to this event, although the life of the patient might often be saved, if the precise nature of the accident were known, and the bone speedily perforated. The cases, which he relates, are calculated to show, that a fracture of the skull is not likely to be followed by an equal degree of extravasation in every part, as the vessels connecting the dura mater to the cranium are, in most parts of that membrane, of a small size. If these are accidentally ruptured, a slight hæmorrhage ensues, which soon stops, and only a thin stratum of coagulated blood is found if the bone be removed. But if the fracture happens in the track of the principal artery of the dura mater; if the trunk, or even a considerable branch of that vessel, be torn, the hæmorrhage will be pro-

fuse, and the operation of the trephine become immediately necessary to preserve the life of the patient. In the three cases that Mr. Abernethy has related, the operation was performed very shortly after the accident: in the first, the brain was so compressed that it did not regain its level; in the second, it rose slowly as the blood found its way through the vessels; and in the third, it rose quickly, and the functions of the brain were as quickly restored.

"It is of great importance," says Mr. Abernethy, "to distinguish accurately the nature of such cases; and the distinction is not difficult when there is an interval of sense between the blow and the stupor occasioned by the effused blood. In the first related case, for instance, the nature of the case was made sufficiently evident by this circumstance. But though we are assured that the patient labours under the effects of compression, we cannot, in many instances, know the situation of the compressing cause. In other cases again, where there is no interval of sense after the accident, we are at a loss to determine whether the senseless state be the effect of compression or of concussion. Every surgeon must acknowledge that it would be a very desirable thing to ascertain when blood is effused between the dura mater and the skull; for if the extravasation has happened in the more interior parts, a surgical operation is not likely to afford relief. Now, if the extravasation which compresses the brain be situated immediately beneath the bone, I think there are signs by which it will be disclosed; and as sufficient notice has not been taken of these, I wish particularly to call the attention of surgeons to them.

"If there be so much blood on the dura mater as materially to derange the functions of the brain, the bone, to a certain extent, will no longer receive blood from within; and by the operation performed for its exposure, the pericranium must have been separated from its outside. I believe that a bone so circumstanced *will not be found to bleed;* and I am certain it cannot, with the same freedom and celerity as it does when the dura mater remains connected with it internally. I need hardly say, that, in the cases which I have related, there was not the least hæmorrhage. But it is right to mention, that I have also twice been able, by attending to the want of hæmorrhage from the outside of the cranium, to ascertain *the extent to which the dura mater was detached within*; and very frequently, when symptoms appeared to demand a perforation of the skull, I have seen it contra-indicated by the hæmorrhage from the bone, and, as the event has proved, *rightly*.

"When the bone has remained long bare, the case may become perplexing. I once scraped a portion of the cranium which had been some time denuded, and found that it bled in such a manner, as sufficiently to point out the adhesion of the dura mater, and of course the inutility of employing the trephine.

"Where the extravasation on the dura mater is but small, it will probably not require any operation. A slight hæmorrhage from the bone, which may happen from the anastomosing of the vessels within its substance, will not, in this case, lead to any injurious error. But, from what I have observed, I am inclined to believe, that even a small effusion of blood will diminish the hæmorrhage from the superincumbent bone."

What Mr. Abernethy has said, sufficiently shows, that Mr. Pott's idea, *that the bone will perish when the dura mater is detached for any considerable space from its inside*, if not incorrect, is at least to be received with some qualification.

COMPRESSION, the act of pressing or squeezing some matter together, so as to set its parts nearer to each other, and make it possess less space. *Compression* properly differs from *condensation*, in that the latter is performed by the action of cold, the former by some external violence.

COMPRE'SSOR NA'RIS, (from *comprimo*, to press together), the *Rinæus, vel nasalis*, of Douglas; a muscle of the nose, that compresses the alæ towards the septum nasi, particularly when we want to smell acutely. It also corrugates the nose, and assists in expressing certain passions. It arises, by a narrow beginning, from the root of the ala nasi externally, and spreads into a number of thin, separate fibres, which run up along the cartilage in an oblique manner towards the back of the nose, where it joins with its fellow, and is inserted into the narrow extremity of the os nasi and nasal process of the superior maxillary bone.

CONA'RIUM, (κωναριον; from κωνος, *a cone)*, a name for the pineal gland; from its conical shape. See PINEAL GLAND.

CONA'TUS, a term frequently used in physics, and defined by some to be a quantity of motion, not capable of being expressed by any time or length; as the *conatus recedendi ab axe notus*, which is the endeavour that a body, moved circularly, makes to recede, or fly off from the centre or axis of its motion.

CONCENTRATION, in general, signifies the bringing things nearer a centre. In a chemical view, the particles of salt in sea-water are said to be concentrated; that is, brought nearer each other, by evaporating the watery part. Concentration is employed: 1. To lessen the quantity of diluting fluid, as in the instance just mentioned. 2. As a preliminary step to crystallization.

CONCEPTA'CULUM, or CONCEPTACLE, in botany, a pericarpium of a single valve, which opens on one side lengthways, and has not the seeds fastened to it.

CONCEPTION, (from *concipio*, to conceive);

the impregnation of the ovum in the female ovarium by the prolific aura of the male semen. See Ovum and Ovarium. The manner in which the human race is propagated has been the subject of investigation for a long period of time. But that succession of opportunities necessary for such an examination not being attainable in the human species, physiologists have had recourse to the dissections of inferior animals, on the presumption, that there is not only a common principle by which viparous animals are propagated, but also that common effects are produced by the operation of that principle. Great attention has been paid to the cultivation of this subject; but in the detail of the circumstances, which are said to occur in the conception or production of the human fœtus, several are admitted which it would be extremely difficult to demonstrate or prove. Dr. Denman's account of the present state of our knowledge, on this obscure subject, is remarkably perspicuous.

"Previous to or during the act of coition, it is presumed, that one or more of the vesicles, or ova, contained in the ovaria, is brought to a state fit for impregnation, and that the male semen, being transmitted into the cavity of the uterus, is thence conducted by one of the fallopian tubes to one of the ovaria, where it perfects the rudiments of the fœtus, or impresses them, already perfected, with the principle of life. The prolific ovum, having undergone its first changes in the ovarium, is then loosened from its connexion, grasped by the fimbriæ, and reconveyed, by one of the fallopian tubes, to the cavity of the uterus.

"When the ovum is impregnated, and while it remains in the ovarium, the uterus passes through some peculiar changes, by which it is rendered fit for the reception of the ovum. The blood-vessels of the uterus then appear to be enlarged, as in a slight degree of inflammation; the internal surface becomes softer and more spongy in its texture; and a white mucus, which has been likened, from the delicacy of its arrangement, to the web of a spider, is secreted; which, gradually assuming a more solid form and becoming vascular, adheres or is closely united to the uterus, to the whole cavity of which it forms a lining, except at the orifices which lead to the fallopian tubes and the os uteri."

To this membrane anatomists have given various names, and various opinions have been entertained of its formation. It has been called speudo-chorion, or spongy chorion. See Chorion. The celebrated Dr. Hunter has considered it as the inner lamina of the uterus, cast off, like the exuviæ of some animals, after every conception, and has, from this circumstance, called it the decidua; and from the manner of its passing over the ovum, the decidua reflexa. All writers upon this subject, it is certain, agree, that its formation is contemporary with conception; and that it precedes the time when the impregnated ovum passes from the ovarium into the uterus, as it is found in the case of an extra-uterine fœtus. It may, therefore, Dr. Denman thinks, be deemed an indispensably requisite preparation of the uterus, for the reception of the ovum, and the substance by which this is afterwards connected to the uterus; so that if it were to receive a name from its use, it would not be improper to call it the connecting membrane of the ovum.

The uterus is closed soon after conception certainly in brute animals, and probably in women, lest the very small ovum, together with the hope of the new progeny, should perish. At that time the new mother suffers many disagreeable affections, which have been absurdly attributed, even by able physiologists, to "the subputrid and subalkaline male semen" having been "resorbed into the blood." A nausea is thus said to be occasioned by conception, "almost in the same manner as by swallowing a bit of rotten egg." Most of these complaints are more justly to be attributed to the swelling of the uterus, the retention of the menses, and the compression of the abdominal viscera. See Pregnancy.

On the subject of conception many points present themselves which are purely conjectural; and their developement the more difficult, as we have few experiments to determine the facts, and as even those experiments which have been undertaken are so much at variance with one another. At the first outset, a difficult question immediately presents itself. Whence proceed the first stamina of the animal? Are they from each parent, and is the new animal formed by a junction of the seminal fluids? The similarity of the offspring to both parents seems to confirm this opinion. If analogical reasoning might be permitted, we might adduce numerous examples from the vegetable kingdom, which clearly show, that the offspring is a compound of each parent. The opinion is still farther confirmed by morbid and vicious habits being conveyed, from both parents to their children. On the other hand, we have no certain proof that semen exists in the female; and again, animals may be propagated without any intermixture of seminal fluids, as in the frog, whose spawn is merely sprinkled by the semen of the male. Lastly, the resemblance of the young animal to its father seems only to show, that in the male seed there is some power, which alone can form the soft matter of the little embryo: in like manner this same power, in brute animals, lengthens the pelvis, dilates the thorax, expands the horns, &c.

CO'NCHA, (from κογχη, *a liquid measure amongst the Athenians*); a term applied by anatomists to certain parts of the body; as the hollow of the ear, the spongy bones of the nose, &c.

CO'NCHA AU'RIS; the hollow part of the cartilage of the outer ear.

CO'NCHÆ NA'RIUM, (from *concha*, a shell);

the turbinated portion of the ethmoid bone and the inferior spongy bones of the nose, which are covered by the Schneiderian membrane.

CONCOCTION, an obsolete term in medicine, signifying the change which the food undergoes in the stomach. It was also used to denote a salutary and spontaneous operation in the system, during the existence of a fever, in which the febrile matter was said to be *concocted* previous to its expulsion. See COCTION.

CONCOU, a name given by the people of Guinea, to a herb, which is in great esteem among them, for killing that troublesome sort of worm, called the *Guinea-worm*, which breeds in the skin. They bruise the leaves, and, mixing them with oil, apply them in form of a cataplasm.

CONCRETE, (from *cum* and *cresco*, to grow together); a substance formed by the composition or union of several particles together into a visible mass, whereby it becomes of some particular figure and property.

CONCRETION, the uniting several small particles of a natural body into sensible masses or concretes, whereby it becomes particularly figured and determined, and is endued with particular properties. This term denotes also the act whereby soft bodies are rendered hard; or an insensible motion of the particles of a fluid or soft body, whereby they come to a consistence. It is indifferently used for induration, condensation, congelation, and coagulation.

CONCUSSION, (from *concutio*, to shake together); concussion of the brain. By this is meant such an injury, from external violence, as either obstructs or destroys the functions of the brain, without leaving behind it such marks as to allow its nature to be ascertained by dissection. Most of the symptoms attending compression of the brain occur also in concussion; but in a compressed state of the brain they are more permanent. See COMPRESSION. There is no discharge of blood from the eyes, nose, or ears, which frequently happens in compression; and instead of that apoplectic stertor in breathing which accompanies compression, the patient seems to be in a sound and natural sleep. The pulse is irregular and slow in compression, and grows stronger and fuller by blood-letting; but in concussion it is weaker, being soft and equal, and sinks by blood-letting. There are besides, convulsions, in compressions, which are not observed in a state of concussion. The symptoms arising from concussion come on immediately after the injury is received. In the violent degrees of these, the patient remains quite insensible; the pupils are much dilated, and do not contract though the eyes be exposed to the strongest light.

In more violent accidents, especially when the patient is rendered insensible, it is extremely difficult to distinguish between concussion and depression; for symptoms which have been supposed to arise entirely from concussion, have, after death, been found to be owing to extravasation or undiscovered fracture; and extravasation has been blamed, when, on dissection, not the least morbid appearance could be discovered.

In concussion the pulse will frequently sink and become feeble, even after the discharge of eight or ten ounces of blood. In doubtful cases, therefore, blood-letting should be practised with great caution. If the pulse become fuller and stronger after discharging a moderate quantity, if the blood appear sizy, and especially if the patient become more sensible, it may be concluded that the symptoms depend upon extravasation, depression of the skull, or some degree of inflammation; and as long as advantage seems to be derived from blood-letting, we may repeat it; but if, upon drawing a few ounces of blood, the pulse become feeble, and especially if, along with this, the patient become more weakly, we should immediately desist from any further evacuation of blood; and in place of it, we ought to give such remedies as may support and strengthen the patient: cordials ought to be given internally, and stimulants applied externally. Warm wine should be given in proportion to the degree of debility induced; the patient, who is apt, in this case, to become cold, should be kept warm by proper coverings; a blister ought to be put to all that part of the head in which the skin has been injured; sinapisms should be applied to the feet; gentle laxatives are useful, and should be regularly given, so as to keep the body open. If the patient cannot swallow wine in sufficient quantity, volatile alkali, ardent spirits, and other cordials of a stimulating kind, it is said, should be given; but of this practice we must speak distrustfully. In concussions of the brain, Mr. Bromfield has recommended antimonial opiates, and several other practitioners agree with him; though some consider opium as hurtful in the early stages of the disorder, and are of opinion, that even wine and other cordials ought to be given with some degree of caution. Mr. Bromfield's *anodyne sudorific*, consists of one part of tincture of opium, joined with three of vin. antimon. tartar. and the dose he usually directed, is ten drops, every four or six hours.

Issues, or the frequent repetition of blisters to the different parts of the head and neck, by which an almost constant stimulus is preserved, are much recommended. When patients are recovering from accidents of this kind, a liberal use of bark, steel, and mineral waters, &c. have sometimes been of service. When the stomach is loaded, gentle vomits become necessary; and vitriolated zinc is reckoned the best in such cases. When much languor, inactivity, and loss of memory, continue,

electricity long applied has been attended with advantage. This remedy, however, would be hurtful where any symptoms of compression or inflammation of the brain are present.

On this important subject Mr. Abernethy's observations deserve particular attention. He is of opinion that the effects of concussion have not been justly described by authors, nor the symptoms related by them those which usually occur. In his Surgical Essays, he, therefore, selects two cases out of many others, in order to show what really are the common consequences of this injury named concussion.

"The whole train of symptoms following a concussion of the brain," says he, "may, I think, be properly divided into three stages. The *first* is, that state of insensibility and derangement of the bodily powers which immediately succeed the accident. While it lasts, the patient scarcely feels any injury that may be inflicted on him. His breathing is difficult, but, in general, without stertor; his pulse intermitting, and his extremities cold. But such a state cannot last long; it goes off gradually, and is succeeded by another, which I consider as the *second* stage of concussion. In this, the pulse and respiration become better, and though not regularly performed, are sufficient to maintain life, and to diffuse warmth over the extreme parts of the body. The feeling of the patient is now so far restored that he is sensible if his skin be pinched; but he lies stupid, and inattentive to slight external impressions. As the effects of concussion diminish, he becomes capable of replying to questions put to him in a loud tone of voice, especially when they refer to his chief suffering at the time, as pain in the head, &c otherwise, he answers incoherently, and as if his attention was occupied by something else. As long as the stupor remains, the inflammation of the brain seems to be moderate; but as the former abates, the latter seldom fails to increase; and this constitutes the *third* stage, which is the most important of the series of effects proceeding from concussion.

"These several stages vary considerably in their degree and duration; but more or less of each will be found to take place in every instance where the brain has been violently shaken. Whether they bear any certain proportion to each other or not, I do not know. Indeed this will depend upon such a variety of circumstances in the constitution, the injury, and the after-treatment, that it must be difficult to determine.

"With regard to the *treatment of concussion*, it would appear, that in the first stage very little can be done; and perhaps, what little is done, had better be omitted, as the brain and nerves are probably insensible to any stimulants that can be employed. From a loose, and, I think, fallacious analogy between the insensibility in fainting, and that which occurs in concussion, the more powerful stimulants, such as wine, brandy, and volatile alkali, are commonly had recourse to, as soon as the patient can be got to swallow. The same reasoning which led to the employment of these remedies in the *first* stage, in order to recal sensibility, has given a kind of sanction to their repetition in the *second*, with a view to continue and increase it.

"But here the practice becomes more pernicious, and less defensible. The circumstance of the brain having so far recovered its powers, as to carry on the animal functions in a degree sufficient to maintain life, is surely a strong argument that it will continue to do so, without the aid of means which probably tend to exhaust parts already weakened, by the violent action they induce.

"And it seems probable that these stimulating liquors will aggravate that inflammation which must sooner or later ensue. The access of it, in the cases which I have related, is sufficiently evident; and its cure is to be effected by the common methods. The great benefit of *evacuations* was, in those cases, very evident."

After some further remarks in opposition to the cordial plan of treatment, and the relation of a fatal case of simple concussion, in which that system would have been manifestly hurtful, Mr. Abernethy adverts to the very desirable object of pointing out the marks by which we may distinguish between compression and concussion of the brain; for these, he apprehends, may in general be distinguished.

"As far as my observation goes," says he, "the insensibility is much less in concussion, especially after a short time has elapsed. Patients in this case, though they seem reluctant to answer questions, yet complain much if their heads are moved; and in those instances where it was judged necessary to inspect the bone, I have generally found they made great complaint during the operation. The pupils also are usually more contracted than in compression of the brain, the muscles of the limbs retain their natural state of tone, and respiration is performed with little or no stertor, though the pulse generally intermits in a very considerable degree. In the slighter cases of concussion, the sickness of the patient is often very great.

"But, in cases of compression of the brain, circumstances very much the reverse of those just related take place; the sensibility is much diminished in proportion to the degree of the injury; from this cause also the pupils are dilated, and the limbs relaxed; the respiration is attended with stertor; and the pulse is subject to much less intermission."

CONDENSATION, the act whereby a body is rendered more dense, compact, and heavy. The word is commonly applied to the conversion of va-

pour into water, by distillation, or naturally in the clouds. The way in which vapour commonly condenses, is by the application of some cold substance. On touching it, the vapour parts with its heat which it had before absorbed; and on doing so, it immediately loses the proper characteristics of vapour, and becomes water. But though this is the most common and usual way in which we observe vapour to be condensed, nature certainly proceeds after another method; since we often observe the vapours most plentifully condensed when the weather is really warmer than at other times.

CO'NDER; a name for frankincense, or olibanum. See OLIBANUM.

CONDIME'NTA, (from *condio*, to season or preserve). Although these are not properly alimentary matters, or such as become ingredients in the composition of the animal fluid, yet, Dr. Cullen says, they are taken with advantage, along with the proper aliments, the digestion and assimilation of which, they in some degree modify. They are of two kinds, saline, or acrid; having this acrimony for the most part residing in their oily parts. Of the first, the chief is sea-salt; and it is especially employed for preserving meat, before it is employed in diet, for a longer time than it could be otherwise preserved from putrefaction.

For this purpose salt is applied in large proportion, and so incorporated with the substance of the meat, that it cannot be again washed out before the meat is employed in diet. Hence it happens, that when salted meats are eaten in that condition, the salt is often taken in in large quantity, and diffused in the mass of blood. If the salted meats, however, be taken in moderate quantity only, Dr. Cullen says, the salt has the effect of exciting the powers of digestion; and such meat is often more easily digested, than entirely unsalted meats are. But when salted meats make the greatest part of our diet, the salt increases greatly the saline state of the blood, and induces all the symptoms of scurvy. This, however, has been disputed of late; but Dr. Cullen thinks the arguments adduced in that instance fallacious.

Nitre is another article frequently employed, and joined with sea-salt, in preserving meat to be employed in diet; but as it is commonly used in small proportion only, the particular effects of it in the human body are not to be perceived.

Another important condiment, is *sugar.* It is certainly antiseptic, and therefore properly employed in preventing the putrefaction of meat. It is also frequently applied to vegetables; but from the preparation of boiling, which is commonly necessary in order to their being impregnated with the sugar, the *condita*, except a few that contain a large proportion of a more fixed aromatic substance, can be considered only as sugar. This is often applied to the acid and acescent fruits; and when applied in the consistence of a syrup, it preserves them for a long time from any fermentation, but it does not destroy their acescency; and when such *Preserves* are taken into the stomach, the sugar introduced along with them renders them much disposed to an acescent fermentation. In the quantity that sugar is commonly employed, either for improving the relish of several kinds of food, or for correcting their acidity, it can only be hurtful by its acescency in the stomach, and can hardly make any proper part of the mass of blood. If taken in very large quantity, and in greater proportion than it can enter into the composition of the animal fluid, sugar, Dr. Cullen thinks, may increase the saline state of the blood, and induce disorders.

Vinegar, another saline condiment, is a powerful antiseptic, employed in several ways for preserving animal substances from putrefaction. We must consider vinegar as a vegetable acid that may be taken with more safety than the fossil acids. See ACIDS. Animal food, preserved by vinegar, is hardly ever so much impregnated with it as to be rendered less digestible or less nutritious. It renders it only less putrescent; and therefore it is a condiment of animal food that is in every respect suited to the human constitution. Vinegar is also employed in the preservation of vegetables from every fermentation. So preserved, they are called *Pickles;* almost the whole of which may be considered as having no other quality but that of vinegar.

The aromatic condiments are such substances as contain a large proportion of essential oil. See AROMATICS. There are two kinds; those produced in the torrid zone, containing an oil of greater specific gravity than water, but of some volatility, and at the same time acrid and inflammatory as applied to the sensible parts of our bodies. The other aromatics are those afforded chiefly by the verticillated or umbelliferous plants of Europe. They are of less specific gravity, and of less acrimony, but of more volatility. The whole of the essential oils are more or less antiseptic. Both are employed in two ways: first as antiseptics, and joined with saline matters for preserving meat; or, secondly, they furnish sauces, and are taken in with our food, either to render these more grateful and sapid, or by the stimulus they give to the stomach to assist in digestion. Dr. Cullen says that, in moderate quantity, they may promote digestion, and prove carminative, which shows that they are most properly employed with a vegetable diet: but as, in large quantity, they are stimulant and heating to the system, *not necessary with animal food;* and their frequent repetition renders an increase of their quantity constantly necessary, and weakens the tone of the stomach.

Acrid substances are also employed as condiments. These are especially taken from the class of tetradynamia, and they are chiefly the *mustard* and *horse-radish*. Taken in with our food, they stimulate the stomach and assist digestion; and further, as they evidently promote perspiration and urine, they obviate the putrescent tendency of the system. This has been so much remarked, that the vegetables of this class, as fraught with this peculiar acrimony, are justly denominated Antiscorbutic. Dr. Cullen thinks these substances as fit to be used with animal food, as the aromatics are to be the proper condiments of our vegetable aliments.

Plants of the garlic tribe, of the milder kind, as the onion and leek, and especially when deprived of their acrimony, afford a great deal of nutritious matter; and so far as these, with the eschalot and others, are taken in as condiments, Dr. Cullen says, they are extremely safe and proper. The more acrid of this genus, as the garlic, is almost only employed as a condiment; and where the odour and taste can be admitted, it certainly promotes digestion. As promoting perspiration and urine, the whole of this order of plants are, with the tetradynamia, properly joined with our animal food, and justly also reckoned antiscorbutics.

To the list of condiments, Dr. Cullen adds Capsicum, Ketchup and Soy; and concludes his strictures on them, by observing, that the whole of our seasonings consist of salt, vinegar, and aromatics, combined together: and "if they are taken only in the quantity necessary to render the food more sapid, they may increase the appetite and favour full eating; but they can hardly otherwise do harm, unless when the aromatics are taken in such large quantity as to weaken the tone of the stomach."

CONDI'TA, preserves. These are made by steeping, or boiling, recent articles of the vegetable kind, first in water, then in syrup or a solution of sugar. The subject is afterwards kept either moist in the syrup, or taken out and dried, that the sugar may candy upon it. This last is the most usual method. The Latins and the latter Greeks meant by *conditum* a sort of *mulsum*, that is, a wine impregnated with honey and aromatics.

CONDU'CTOR, an instrument to pass up into a sinus or fistula, to direct the knife in cutting it open.

CO'NDYLE, (κονδυλος, from κονδυ, *an ancient cup, shaped like a joint*); a rounded eminence of a bone in any of the joints, as in the knee, the knuckles, &c.

CONDYLO'MA, (κονδυλωμα, from κονδυλος, *a tubercle or knot*); a soft, wart-like, excrescence, that appears about the anus and pudendum in both sexes. These, from their figure, get the name of *fici*, *aristæ*, &c. from their particular resemblances; but they are all of the same nature, and to be cured by the same means. They sometimes grow within the gut itself, but more frequently are situated at the verge of the anus. They vary considerably in their colour, figure, and consistence. Sometimes they are only one or two in number, but commonly all the skin about the anus becomes covered with them. They vary in size from that of ordinary warts to that of split garden beans. They seem originally to be productions of the skin, though at last they sometimes proceed as deep as the muscles. They frequently remain long, without producing much uneasiness. When this is the case, they ought not to be touched; but sometimes they become so troublesome as to render their removal necessary. The softer kinds may frequently be removed by touching them daily with a pencil dipped in tincture of muriated iron, or rubbing them often with gentle escharotics, as crude sal ammoniac, or pulvis sabinæ; but the harder kinds are to be removed chiefly by lunar caustic, or by the knife; the latter of which is greatly preferable, and may be done with the utmost safety. The sores are afterwards to be treated like wounds produced by any other cause. If caustic is to be used, care ought to be taken that it do not injure the rectum.

CONE, in physics, a solid figure whose base is a circle, and is produced by the revolution of the plane of a right angled triangle round the perpendicular leg. In anatomy, a conical vessel is such a one as, from one end, continually grows narrower towards the other, till it terminates almost in a point; and such are the arteries, except in a very few places, where, for manifest ends, they become cylindrical.

CONE'SSI BARK. See CONESSI CORTEX.

CONE'SSI CO'RTEX, (*Conessi*, Malabrens.); also called *Codago-pala*, and *Cortex profluvii*. The bark of the *Nerium antidysentericum; foliis ovatis, acuminatis, petiolatis*, Linn. This tree grows on the coast of Malabar. The bark is of a dark black colour externally, and generally covered with a white moss or scurf. It is very little known in the shops; has an austere, bitter taste; and is recommended in diarrhœas, dysenteries, &c. as an astringent remedy.

CONFECTION, (from *cum*, and *facio*, to make up together); a term generally applied to a medicine, compounded with dry ingredients of various kinds, powdered and made into the consistence of a thin electuary with honey or syrup. The confections in our present pharmacopœias, are the *Confectio aromatica*, *Confectio Japonica*, and *Confectio opiata*.

CONFE'RVA, in botany; a genus belonging to the cryptogamia class of plants; and, in the natural method ranking under the 57th order, *Algæ*. The tubercles are of different sizes, on capillary, very long fibres. There are 21 species, most of them growing on stones in slow streams, on the sides of cisterns, or in ponds.

CONFE'RVA, (from *conferveo*, to knit toge-

ther); a kind of moss, so named from the property formerly attributed to it, of uniting broken bones.

CONFE'RVA HELMINTHOCO'RTOS. See CORALLINA CORSICANA.

CONFE'RVA RIVA'LIS; the *Conferva rivalis; filamentis simplicissimis æqualibus longissimis*, Linn. This plant has been recommended in cases of spasmodic asthma, phthisis, &c. on account of the great quantity of vital air which it is said to contain; but as oxygen is now administered in a much more effectual way (see PNEUMATIC MEDICINE), the properties of the conferva rivalis are of little account.

CONFLUENT SMALL POX. See VARIOLA CONFLUENS.

CONFORMATION, that make and construction of the human body which is peculiar to every individual. Hence, *mala conformatio* signifies some fault in the first rudiments; whereby a person comes into the world crooked, or with some of the viscera or cavities unduly framed or proportioned. See MONSTER. Many are subject to incurable asthmas, from a too small capacity of the thorax, and such like vitious conformations.

CONGELATION, (from *congelo*, to freeze); that change of liquid bodies which takes place when they pass to a solid state, in consequence of the abstraction of the caloric which kept them in a state of fluidity. See FROST.

CONGE'RIES, a Latin word, sometimes used in our language for a collection or heap of several particles of bodies united into one mass or aggregate.

CONGESTION, the same as collection of matter, as in abscesses and tumors.

CO'NGIUS, (*quasi congerus*, from *congero*, to heap up); a GALLON. This is a very ancient measure, and is generally said to have been equal to ten pints of wine, and nine of oil. The Athenian congius, or conchus, weighed nine pounds, and the Roman weighed ten, or contained ten Roman pints of wine. In the London and Edinburgh Dispensatories, the gallon is only eight pints.

CONGLOBATE GLAND, (*conglobate*, from *conglobo*, to gather into a ball), or Lymphatic gland; a round gland formed of a contortion of lymphatic vessels, connected together by cellular structure, having neither a cavity nor an excretory duct: such are the mesenteric, inguinal, axillary glands, &c. See GLANDS.

CONGLOMERATE GLAND, (*conglomerate; from conglomero*, to heap upon one); a gland composed of a number of glomerate glands, whose excretory ducts all unite in one common duct. Of this kind are the salivary, parotid glands, &c.

CONGLUTINATION, (from *cum*, and *gluten*, glue), the glueing or fastening any two surfaces together by the intermission of a third, whose parts are unctuous or tenacious. Thus adhesion takes place between the lungs and the pleura, through the intermedium of coagulable lymph, thrown out in consequence of inflammation.

CONI'FERÆ, in botany, an order of plants in the *Fragmenta methodi naturalis* of Linnæus, containing the following genera, viz. *cupressus*, *ephedra*, *equisetum*, *juniperus*, *pinus*, *taxus*, *thuja*.

CONIFEROUS, (from *conus*, a cone, and *fero*, to bear); such trees, &c. as bear a squamose scaly fruit, of a woody substance, and a figure approaching to that of a cone, in which there are many seeds; and when they are ripe, the several cells or partitions in the cone gape open, and the seeds drop out. Of this kind are the fir, pine, beech, and the like.

CO'NIUM, (κονειον; from κονια, *dust*, according to Linnæus; or from κωναω, *circumago*, on account of its inebriating, poisonous quality) HEMLOCK, a genus of the digynia order, belonging to the pentandria class of plants; and in the natural method ranking under the 45th order, *Umbellatæ*. The partial involucra are halved, and mostly tryphyllous; the fruit subglobose and quinque-striated, the striæ crenated on each side. The species are three: 1. The *maculatum*, or *greater hemlock*, grows naturally on the sides of banks and roads in many parts of Great Britain. It is a biennial plant which perishes after it has ripened its seeds. It has a long taper root like a parsnip, but smaller. The stalk is smooth, spotted with purple, and rises from four to upwards of six feet high; branching out toward the top into several smaller stalks, garnished with decompounded leaves, whose lobes are cut at the top into three parts; these are of a lucid green, and have a disagreeable smell. The stalks are terminated by umbels of white flowers, each being composed of about ten rays or small umbels, and have a great number of flowers, which spread open, each sitting upon a distinct footstalk; the seeds are small and channelled, and like those of aniseed. It flowers in June, and the seeds ripen in autumn. 2. The *tenuifolium*, with striated seeds, differs from the first in having taller stalks, which are not so much spotted. The leaves are much narrower, and of a paler green; and this difference is constant. It is a biennial plant, and grows naturally in Germany. 3. The *africanum*, with prickly seeds, is a native of the Cape of Good Hope. This plant rarely grows above nine inches high; the lower leaves are divided like those of the small wild rue, and are of a yellowish colour; those upon the stalk are narrower, but of the same colour; these are terminated by umbels of white flowers, each of the larger umbels being composed of three small ones; the involucrum has three narrow leaves situated under the umbel. This flowers in July, and ripens seed in autumn; soon after which the plants decay.

The medical uses of this plant are spoken of under the article CICUTA. The first species is some-

times applied externally, in the form of fomentation or poultice, as a discutient. Its medicinal properties have also been communicated to the system in the way of a bath or semicupium. See the article UTERUS. It has been justly reckoned poisonous, when used in any considerable quantity. In small doses however it may be taken with great safety; and these being gradually augmented, it sometimes proves a powerful remedy. Strong evidence of both these facts is afforded us, in the case of a young gentleman, a patient of Mr. Hunter's, who, for an unmanageable bubonic ulcer, took to the amount of ℥iiss in a day, and was greatly benefited. Having laid this remedy aside however, for some time, he unfortunately, one morning, took ℥v, viz. half the dose he had left off with. This quantity produced great restlessness and anxiety; he dropped, insensible, from his chair, fell into convulsions, and expired in two hours.

CONJUGA'TA, (from *con*, and *jugo*, to yoke together), in botany, growing in pairs.

CONJUNCTI'VA, or *Membrana conjunctiva;* (from *conjungo*, to join together), also called *tunica conjunctiva;* a thin membrane, on the forepart of the eye. One portion of it lines the inner surface of the palpebræ, that is, of the tarsi and their broad ligaments. At the edge of the orbit it has a fold, and is continued from thence on the anterior half of the globe of the eye, adhering to the tunica albuginea; so that the palpebræ and the forepart of the globe of the eye are covered by one and the same membrane, which does not appear to be a continuation of the pericranium, but has some connection with the broad ligaments of the tarsi.

The name of *conjunctiva* is commonly given only to that part which covers the globe, the other being called simply *the internal membrane of the palpebræ;* but we may very well name the one *membra oculi conjunctiva*, and the other *membrana palpebrarum conjunctiva*. That of the palpebræ is a very fine membrane, adheres close to the palpebræ, and is full of small capillary blood-vessels. It is perforated by numerous imperceptible pores, through which a kind of serum is continually discharged; and it has several very evident folds, which have their particular functions.

This covering of the eye adheres by the intervention of a cellular substance; consequently it is loose, and somewhat moveable; and it may be taken hold of with a fine pair of forceps, and separated in several places from the tendinous coat. It is of a whitish colour; and being transparent, the albuginea makes it appear perfectly white: these two coats, together, forming what is called *the white of the eye*. The greatest part of the numerous vessels which run upon it contain naturally only the serous part of the blood, and consequently are not discoverable, except by anatomical injections, inflammation, &c. With the point of a good knife, Dr. Monro says, we may continue the separation of this membrane over the cornea.

The membrana conjunctiva is the seat of the Ophthalmia. See OPHTHALMIA.

CONNA'RUS, Ceylon sumach, a genus in Linnæus's botany.

CONNA'TUS, (from *con*, and *nascor*, to grow together), in botany, two or more parts of a vegetable, growing together, and having the appearance but of one; as two apples, two nuts, or two leaves.

CONNEXION OF BONES. See ARTICULATION.

CONNE'XUS, (from *con*, and *necto*, to knit together), in botany, growing in pairs.

CONNIVE'NTES VA'LVULÆ, those wrinkles, cells, or folds, which are found in the inside of the two intestines duodenum and ilium. See DUODENUM.

CONOCARPODE'NDRON, a species of LEUCADENDRON.

CONOCA'RPUS, BUTTON-TREE, a genus in Linnæus's botany. He enumerates three species.

CONOI'DES CORPUS, a name for the *Glandula pinealis*. See CEREBRUM.

CONSENT OF PARTS, in the animal economy, an agreement of sympathy, whereby when one part is immediately affected, another at a distance becomes affected in the same manner. This mutual accord or consent is supposed to be effected by the commerce of the nerves, but in a way with which anatomists are as yet unacquainted. See SYMPATHY.

CONSE'RVA, (from *conservo*, to keep), a conserve; a composition of some recent vegetable and sugar, beaten together into a uniform mass of the consistence of thick honey. In pharmacy, this is done for preserving certain simple substances undried, in an agreeable form, with as little alteration as possible in their native virtues; and in some cases this is very convenient. Vegetables, whose virtues would be destroyed by drying, may in this form be kept uninjured for a considerable time: for, by carefully securing the mouth of the containing vessel, the alteration, as well as dissipation, of their active principles, is generally prevented; and the sugar preserves them from the corruption which juicy vegetables would otherwise undergo. The sugar should be pounded by itself, and passed through a sieve, before it be mixed with the vegetable mass, for without this it cannot be properly incorporated. Rose buds, and some other vegetables, are prepared for mixing with sugar, by a small wooden mill contrived for the purpose of grinding them to a pulp.

There are, however, vegetables whose virtues are impaired by this treatment. Mucilaginous substances, by long lying with sugar, become less glutinous; and astringents sensibly become milder. Many flowers are of so delicate a texture, as almost entirely to lose their peculiar qualities on

being beaten or bruised. Thus, it is obvious, that in this form, on account of the large admixture of sugar, only substances of considerable activity can be used with advantage as medicines. Indeed, conserves are at present considered chiefly as auxiliaries to substances of greater efficacy, or merely as intermedia. They are very convenient for reducing into boluses or pills, the more ponderous powders, as calomel, the oxyds of iron, and other mineral preparations; which, with liquid or less consistent matters, as syrups, will not cohere sufficiently.

The conserves directed in the British Pharmacopœias are as follow: 1. *Cons. citri aurantii*, Edin. *Aurantii Hispalensis*, Lond. *Corticis aurantii*, Dubl. *Conserve of orange-peel.* 2. *Cons. Rosæ caninæ*, Edin. *Cynosbati*, Lond. *the Conserve of hips.* 3. *Cons. rosæ rubræ*, Edin. Lond. *Rosæ*, Dubl. *Conserve of red rose buds.* 4. *Cons. absinthii maritimi*, Lond. *Conserve of sea wormwood.* 5. *Cons. lujulæ*, Lond. *Acetosellæ*, Dubl. *Conserve of wood sorrel.*

In preparing these, pluck the leaves from the stalks, or unblown petals from the cups, taking off the heels. Take off the outer rind of the oranges by a grater. Beat them with a wooden pestle in a marble mortar, first by themselves, and afterwards with three times their weight of refined sugar, until they be mixed.

It is to be observed, that the London college adds only twenty ounces of sugar to one pound of the pulp of hips; and that the Dublin add only twice their weight of sugar to the sorrel leaves. La Grange says, that by infusing the red rose-leaves in four times their weight of water, which is afterwards to be expressed from them, they lose their bitterness, and are more easily reduced to a pulp, which he then mixes with a thick syrup, prepared by dissolving the sugar in the expressed liquor, and boiling it down to the consistence of a conserve.

It is scarcely necessary to make any particular remarks on these conserves. Their taste and virtues are compounded of those of sugar, and the substance combined with it. The conserves of wood-sorrel and hips are acidulous and refrigerant; the orange-rind and wormwood, bitter and stomachic, and the red-rose buds astringent.

CONSISTENCE, in physics, that state of a body wherein its component particles are so connected or entangled among themselves, as not to separate or recede from each other. It differs from continuity in this, that it implies a regard to motion or rest, which continuity does not; it being sufficient to denominate a thing continuous that its parts are contiguous to each other. In pharmacy the term is used to denote the particular state of any thing between a liquid and a solid.

CONSO'LIDA, (so called, *quia consolidandi et conglutinandi vi pollet;* named from its use in agglutinating and joining together things broken); the plant called Comfrey.

CONSO'LIDA MAJOR. See Symphitum.

CONSO'LIDA MEDIA, or *Bugula;* the upright bugloss, or middle confound. This plant, *Ajuga pyramidalis, tetragona-pyramidalis, villosa, foliis radicalibus maximis*, of Linnæus, possesses subastringent and bitter qualities; and is recommended in *phthisis, aphthæ*, and *cynanche.*

CONSO'LIDA MINOR. See Prunella.

CONSO'LIDA REGA'LIS, also called *Calcatrippa.* Many virtues are attributed to this plant. It is the *Delphinium consolida; nectariis monophyllis, caule subdiviso*, Linn. The flowers are bitter, and a water distilled from them is recommended in ophthalmia. An infusion of the herb is administered in calculous cases, obstructed menses, and visceral diseases.

CONSO'LIDA SARACE'NICA. See Virga aurea.

CONSOLIDATE, (from *cum* and *solidus*, to harden together); a term generally used to express the uniting and hardening of broken bones, or the lips of wounds.

CONSOUND. See Symphitum.

CONSOUND, MIDDLE. See Consolida media.

CONSTIPATION, (from *constipo*, to crowd together); costiveness. A patient is said to be costive when the alvine excretions are not regularly expressed; and when the fœces are so hardened as not to receive their form from the pressure of the rectum upon them. See Obstipatio.

CONSTRI'CTOR, (from *constringo*, to bind together); a name given to those muscles which contract any aperture in the body.

CONSTRI'CTOR I'STHMI FAU'CIUM; the *Glosso-staphilinus* of Winslow and Douglas. This muscle is situated at the side of the entry of the fauces. It draws the *velum pendulum palati* towards the root of the tongue, which it raises at the same time, and, with its fellow, contracts the passage between the two arches; by which means it shuts the opening of the fauces.

CONSTRI'CTOR O'RIS. See Orbicularis oris.

CONSTRI'CTOR PHARYNGIS INFERIOR, also called *Crico-pharyngeus*, and *Thyro-pharyngeus:* a muscle situated on the posterior part of the pharynx. It arises from the side of the thyroid cartilage, near the attachment of the sterno hyoidæus and thyro-hyoidæus muscles; and from the cricoid cartilage, near the crico-thyroidæus. It is inserted into the white line, where it joins with its fellow; the superior fibres running obliquely upwards, covering nearly one half of the middle constrictor, and terminating in a point. The inferior fibres run more transversely, and cover the beginning of the œsophagus. Its use is to compress that part of the pharynx which it covers, and to raise it, with the larynx, a little upwards.

CONSTRI'CTOR PHARY'NGIS MEDIUS,

the *Hyo-pharyngeus*, or *Syndesmo-pharyngeus* of Douglas; a muscle situated on the posterior part of the pharynx. It arises from the appendix of the os hyoides, from the corner of that bone, and from the ligament which connects it to the thyroid cartilage; the fibres of the superior part, running obliquely upwards, and covering a considerable part of the superior constrictor, terminate in a point; and is inserted into the middle of the cuneiform process of the os occipitis, before the foramen magnum, and joined to its fellow at a white line in the middle part of the pharynx. This muscle compresses that part of the pharynx which it covers, and draws it and the os hyoides upwards.

CONSTRI'CTOR PHARYNGIS SUPERIOR, otherwise named *Cephalo-pharyngeus*, *Pterygo-pharyngeus*, *Mylo-pharyngeus*, *Glosso-pharyngeus;* a muscle situated on the posterior part of the pharynx. It arises above from the cuneiform process of the os occipitis, before the foramen magnum, from the pterygoid process of the sphenoid bone, from the upper and under jaw, near the roots of the last dentes molares, and between the jaws. It is inserted in the middle of the pharynx. Its use is to compress the upper part of the pharynx, and to draw it forwards and upwards.

CONSUMPTION, popularly named a decline. See Phthisis Pulmonalis.

CONTAGION, from *contingo*, to meet or touch each other), the same as *Effluvia*, *Miasma*, *Virus*, or *Lues;* infection arising from putrid or other substances, or from persons labouring under contagious diseases. Of *contagions*, a great variety have been supposed to exist; but this seems to be asserted without sufficient evidence. The number of genera and species of contagious diseases, of the class of pyrexiæ, at present known, is not very great. Whether there are any belonging to the order of phlegmasiæ, is doubtful; and though it should be supposed, it will not much increase the number of contagious pyrexiæ: and as each of the contagious diseases has been found always to retain the same character, and to differ only in circumstances, which may be imputed to season, climate, and other external causes, or to the peculiar constitution of the persons affected, it may thence be concluded, that in each of these species the contagion is of one specific nature; and that there is one principal, perhaps one common, source of such contagions.

It is now well known, that the effluvia arising from the living human body, if long confined in the same place, without being diffused in the atmosphere, acquire a singular virulence; and, in that state, applied to the bodies of men, become the cause of a fever which is very contagious. The late observations on jail and hospital fevers have fully proved the existence of such a cause; and it is sufficiently obvious, that the same virulent matter may be produced in many other places. At the same time the nature of the fevers arising, renders it probable, that the virulent state of human effluvia is the common cause of such fevers, as they differ only in a state of their symptoms; which may be imputed to the circumstances of season, climate, &c. concurring with the contagion, and modifying its force.

With respect to these contagions, though they are spoken of above as a matter floating in the atmosphere, it is proper to observe, that they are never found to act but when they are near to the sources from whence they arise; that is, either near to the bodies of men from which they immediately issue, or near to some substances which, as having been near to the bodies of men, are imbued with their effluvia, and in which substances these effluvia are sometimes retained in an active state for a very long time. The substances thus imbued with an active matter, may be called *fomites;* and Dr. Cullen thinks it probable, that contagions, as they arise from fomites, are more powerful than as they arise immediately from the human body.

As there does not appear to be any distinction between contagious and infectious diseases. Dr. Hooper very properly asks: Would it not be proper to apply the term *contagious* (considering the derivation of the word) to those which are communicated by contact only, as the venereal disease, itch, &c.; and *infectious*, to those which are caught through the medium of the atmosphere, &c. without contact, as putrid fever, &c.? It cannot be denied but such a distinction would be convenient, at least, however deficient on the score of precision.

The diseases produced by contagion, are treated of under their particular names. Dr. Carmichael Smith's mode of destroying contagion in jails and ships, is noticed under the article Fumigation.

CO'NTINENS FEBRIS; a *continual* or *continent fever*, which proceeds regularly in the same tenor, without either intermission or remission. This, however, happens very rarely, if ever.

CONTI'NUA FEBRIS, (from *continuo*, to persevere); a *continued fever*, or one that is attended with exacerbations, and slight remissions, but no intermissions. See Fever.

CONTINUED FEVER; one that sometimes remits, but never intermits or goes entirely off till its period is accomplished. See Fever.

CONTO'RTÆ, the name of the 30th order in Linnæus's Fragments of a Natural Method, consisting of plants which have a single petal that is twisted or bent on one side. This order contains the following genera, viz. echites, gardenia, genipa, microcnemum, nerium, periploca, rawolfia, tabernæmontana, vinca, apocynum, asclepias, comeraria, ceropegia, cynanchum, pulmeria, stapelia.

CONTRACTILITY, or expansive elasticity; a

well-known property in bodies, the effect of cohesive power, by which their particles resume their former propinquity, when the force ceases which was applied to extend them.

CONTRACTION, (from *contraho*, to draw together), or CONTRACTURA ; a rigid contraction of the joints. It is a genus of disease in the class *locales*, and order *dyscinesiæ* of Cullen. The species are, 1. *Contractura ab inflammatione*, when it arises from inflammation: 2. *Contractura a spasmo*, called also tonic spasm, and cramp, when it depends upon spasm: 3. *Contractura ob antagonistas paraliticos*, from the antagonist muscles losing their action: 4. *Contractura ab acrimonia irritante*, which is induced by some irritating cause: 5. *Contractura articularis*, originating from a disease of the joint.

In his surgical writings, Mr. Gooch mentions a case in which he cured a contraction of the neck without any operation. This, however, did not happen in consequence of any natural defect of the constitution, but was occasioned by a fall from an horse, in a young woman. When brought to him, long after the accident, her chin was fallen upon her breast, and from the friction by an involuntary and constant vibrating motion, the skin was fretted off both these parts; which, with the pain she suffered upon the posterior part of her neck, made her life very uncomfortable. Various applications and bandages had been tried for two years to no purpose. He gave directions for making a proper machine, represented in his book, by the use of which alone the relaxed parts recovered their tone and action, and she was perfectly cured in six months. By the same contrivance he afterwards cured a similar case of a year's standing, except that the oscillation of the head was not quite so much.

Dr. Aitken treats of a peculiar contraction under the name of *Beriberi* or *Beriberia* (See BERIBERI.) The same writer observes, that *joint-contraction* (as he terms the fifth species) is most frequently symptomatic: and when it depends on muscular contraction only, he advises the tepid bath, and deligation, and counteraction by weights, hung in due proportion, to oppose the contraction. Certain it is, that mechanical force, assisted by vapour baths, and topical relaxants, has gradually succeeded in restoring contracted limbs to their proper position. The operations of Mr. Buzaglio, in this way, are, no doubt remembered by many; and Mr. Pugh, a practitioner in London, succeeds in the treatment of these cases on similar principles. The most new and ingenious invention, however, for purposes of this nature, is Mr. Smith's *Air-pump Vapour-bath*. See VAPOUR-BATH.

CONTRA-FISSU'RA, (from *contra*, opposite, and *findo*, to cleave); a counter-fissure. See FISSURA.

CONTRA-INDICA'TIO, (from *contra*, against and *indico*, to show), contra-indication; as in the case of a symptom attending a disease, which forbids the exhibition of a particular remedy that would otherwise be employed. Thus, the cinchona with vitriolic acid is often given in putrid fevers; but, if there be difficulty of breathing or inflammation of the side, or of any viscus, these are contra-indications to their use.

CO'NTRA SE'MEN. See SANTONICUM.

CONTRAYE'RVA, (from *contra*, against, and *yerva*, Span. an antidotal herb), CONTRAYERVA. The officinal part is the root; which is obtained from two plants, viz. *Dorstenia Drakena; scapis radicatis, foliis pinnatifido-palmatis integerrimis, receptaculis ovalibus*, Linn. and *Dorstenia Houstonii; scapis radicatis, foliis cordatis angulatis acutis, receptaculis quadrangulis*, Linn. Class, *Tetrandria*. Order, *Monogynia*. It has a peculiar kind of aromatic smell, and a light astringent, warm, bitterish taste; and on long chewing it discovers somewhat of a sweetish sharpness. The sort which is generally brought to us, is about an inch or two long, half an inch thick, full of knots, surrounded on all sides with numerous long tough fibres, most of which are loaded with scaly knobs, of a reddish brown colour on the outside, and pale within. The tuberous parts of these roots are the strongest, and should be preferred. They have an agreeable aromatic smell; a rough, bitter, penetrating taste; and, when chewed, they afford evident signs of acrimony. They are reckoned diaphoretic and antiseptic in their effects; and of use in low nervous fevers, and those of the malignant kind; for though taken freely, they do not produce much heat. Dr. Cullen, however, says, both this and serpentaria are powerful stimulants, particularly the last, and both have been employed in fevers in which debility prevailed. However, he thinks wine may always supersede the stimulant power of these medicines, and that debility is better remedied by the tonic and antiseptic powers of cold, and Peruvian bark, than by any stimulants.

The London College directs the following preparation of contrayerva, which, however, is not recognised by the other Colleges:

Pulvis contrayervæ compositus. Lond.

Take of Contrayerva, in powder, five ounces;
Compound powder of crabs claws, one pound and a half.
Mix them.

CONTRE COU, (Fr.) a species of fracture of the skull, called in Latin *contra-fissura*, in which the fracture happens in a part of the bone opposite to that on which the blow was received.

CONTUSION, (*contusio*; from *contundo*, to

knock together); a bruise. Contusions of the integuments and muscles produce pain, swelling, and inflammation, and these, in some cases, may extend to a considerable degree; but in general they are less violent than what take place in cases of sprains of ligaments or tendons; for in these there is frequently a total loss of motion for many weeks, and sometimes for years, if proper attention be not paid. An effusion of fluids always succeeds the injury, which seems to be, for the most part, of a serous nature, as the skin usually retains its natural colour; sometimes the tumefied parts are of a deep red, or leaden colour, owing to a rupture of some vessels conveying red blood.

In the treatment of contusions, these circumstances require attention: 1. To endeavour to prevent the swelling as far as is practicable. 2. To employ those remedies afterwards which are known to be most powerful in preventing or removing inflammation. 3. To restore strength to the injured part after the active symptoms have been subdued. In contusions of the cellular substance, and even of the muscles, the effused fluids are commonly soon absorbed; but in those of the tendinous or ligamentous parts, a very troublesome and painful thickness of the injured parts is apt to continue for a great length of time, and in some instances even for life. It is necessary, therefore, to obviate these symptoms as soon as possible; and for this purpose, cold astringent applications, as lead water, alcohol, vinegar, &c. or poultices formed with the latter, are most commonly used. Others again, with a view to relax the parts fully, make use of water as hot as the patient can bear it. By immersing the injured part in these, immediately after the injury is received, the effusion will at least be somewhat obviated. When the pain is excessive, opiates become necessary.

CONVALESCENCE, the insensible recovery of health; or that state in which, after the cure of a disorder, the body which has been reduced has not yet regained its vigour, but begins to resume its powers. Proper aliments conduce to the re-establishment of the languid faculties; but as the tone of the bowels is weakened, the digestive faculty is not equal to its office, which is shown by light sweats over the whole body; and the smallest excess in this respect is ofentimes the occasion of dangerous relapses.

CONVALLA'RIA, (from *convallis*, a valley); a plant so named, from its abounding in valleys and marshy grounds.

OCNVALLA'RIA, MAJA'LIS; the systematic name of the lilly of the valley. See Lilium convallium.

CONVALLA'RIA POLYGONA'TUM; the systematic name of Solomon's seal. See Sigillum Salomonis.

CONVO'LVULUS, (from *convolvo*, to roll together); a plant so named from its spiral shape, and its twisting round other trees and shrubs. It is hence named in English bind-weed, of which there are many species.

CONVO'LVULUS JALA'PA; the systematic name of the jalap-plant. See Jalapium.

CONVO'LVULUS MAJOR ALBUS; the *Convolvulus sæpium foliis sagittatis, postice truncatis; pedunculis tetragonis, unifloris*, of Linnæus. The juice of this plant is violently purgative, and given in dropsical affections. A poultice of the recent herb, with the addition of a little oil, is recommended in white swellings of the knee-joint.

CONVO'LVULUS MECHOACAN. See Mechoacannæ radix.

CONVO'LVULUS SCAMMO'NIA; the systematic name of the scammony plant. See Scammonium.

CONVO'LVULUS SE'PIUM. See Convolvulus major albus.

CONVO'LVULUS SOLDAN'ELLA; the systematic name of the sea convolvulus. See Brassica marina.

CONVO'LVULUS TURPE'THUM; the systematic name of the turbith plant. See Turpethum.

CONVULSION, clonic spasm; a morbid action of the muscular fibres, known by alternative relaxations, with violent and involuntary contractions of the muscular parts, without sleep. Dr. Cullen arranges this affection in the class *neuroses*, and order *spasmi*. Convulsions are either universal or partial, and have obtained different names according to the parts affected or symptoms attending; as the *risus sardonicus*, when the muscles of the face are affected; *St. Vitus's dance*, when the muscles of the arm are thrown into involuntary motions, with lameness and rotations, &c. The epilepsics, arising from different causes, are convulsive diseases of the universal kind: the muscles of the globe of the eye, causing involuntary distortions, in defiance to the direction of the will, are instances of partial convulsion. The muscles principally affected in all species of convulsions, are those immediately under the direction of the will; as those of the eyelids, eye, face, jaws, neck, superior and inferior extremities. The muscles of respiration, acting both voluntarily and involuntarily, are not unfrequently convulsed; as the diaphragm, intercostals, &c. Convulsions, even when most generally extended, differ from epilepsy in not being attended with any mental affection or abolition of sense, and not followed by the same torpid state.

Clonic spasm, not only of particular parts, but also over the whole body, often takes place from causes not very evident. Sometimes convulsions seem to depend on a certain delicacy or irritability of the nervous system, which is framed with such exquisite sensibility as to be strongly affected by the slightest causes. Delicate women are often

subject to hysterical convulsions, and also hypochondriac people. Convulsions, however, often take their rise from wounds, irritations of the stomach and intestines, by worms, poisons, violent cathartics and emetics, &c.; and very often they are symptomatic, as in dentition, the small-pox, and many kinds of fevers. Dr. Hooper enumerates the more immediate causes of convulsions thus: 1. They arise either from mental affection, or any irritating cause exciting a greater action in the arterial system of the brain and nerves. 2. From an increase of nervous energy, which seems to keep pace, or be equi-potent, with the increased arterial energy excited in the brain. 3. This increased energy, conveying its augmented effects, without the direction of the will, to any muscles destined to voluntary motion, over-irritates them. 4. The muscles, irritated by the increased nervous energy and arterial influx, contract more forcibly and involuntarily by their excited vis insita, conjointly with other causes, as long as the increased nervous energy continues. 5. This increased energy in the nervous system may be excited either by the mind, or by any acrimony in the blood, or other stimuli sufficiently irritating to increase the arterial carbon, nervous influence, and the vires insitæ of muscles. 6. After muscles have been once accustomed to act involuntarily, and with increased action, the same causes can readily produce the same effects on those organs. 7. All parts that have muscular fibres may be convulsed. 8. The sensations in the mind, most capable of producing convulsions, are timidity, horror, anger, and unusual sensibility.

Except in some few cases, convulsions are always to be dreaded; but less in young people than in such as are advanced in life. Those which attack girls under the age of puberty, will generally cease on the appearance of the menses; and boys have likewise a chance of being relieved as they advance in life: but in grown-up people, unless the cause be very evident, a cure is hardly to be expected, especially after the disease has been of long continuance. The treatment is very much the same with that of epilepsy, (see Epilepsia); but a recovery is most frequently obtained by the removal of the existing cause.

Where infants are attacked with convulsions, they are said to have *fits* (see Fits); and their lives depend on an immediate remedy. In that case, their nurses should be instructed to immerse them in a vessel of warm water, till medical aid is procured. The convulsions which arise in parturition belong to the article Labour.

CONY'ZA CŒRU'LEA, (κονυζα; from κονις, *dust;* because its powder is sprinkled to kill fleas); the herb flea-bane. This acrid plant is exhibited on the continent in some diseases of the chest, but is not inserted in the British pharmacopœias.

CONY'ZA ME'DIA, or *Arnica Suedensis.* It is the *Inula dysenterica; foliis amplexicaulibus, cordato-oblongis; caule villoso, paniculato; squamis calycinis, setaceis,* Linn. This is an acrid, subaromatic plant, possessing some antidysenteric virtues. It is sometimes called *arnica spuria.*

COOKERY, or Cooking, the exercise of art in the preparation of food for human sustenance. It consists not only in the application of heat under various modifications and circumstances, but also in the due intermixture of condiments, calculated as well to please the palate as to promote nutrition. The exercise of this art is peculiar to man, and it has been deemed, by naturalists, one of his peculiar characteristics, that he is "a *cooking* animal."

Dr Cullen says, that the cooking of vegetables by boiling (see Boiling) renders them more soluble in the stomach, notwithstanding the degree of coagulation which their juices undergo. In the second place, the application of a boiling heat dissipates the volatile parts of vegetable substances, which are seldom of a nutritious natnre, but, in many cases, have a tendency to prove noxious. In the third place, boiling helps to extricate a considerable quantity of air that, in the natural state of vegetables, is always fixed in their substance; and it is probably in this way especially, that heat contributes to the dividing and loosening the cohesion of their smaller parts. Thus they are rendered less liable to ferment, and to produce that flatulence which is so troublesome to weak stomachs.

In the cookery of animal substances, some practices, previous to the application of heat, are to be considered as affecting its solubility in the stomach; particularly salting, drying, and pickling. These processes are spoken of under the article Condimenta. Dr. Cullen is, at least, of opinion, that these means, though useful in preserving animal food, "can never increase its nutritious quality, or render it even of more easy digestion." Drying unites the solid parts of meat more closely together; and though the addition of salt tends to stimulate the stomach, and promote digestion, yet this last must be in small quantity, and the meats so preserved taken in moderate quantity also. For when meats have been long and much salted, they are certainly hurtful to the system.

The keeping of meat, without any preparation, till it advances towards putrefaction, renders it more easy of solution in the stomach; and if the putrescency is in a moderate degree only, it does not impair its nutritious quality of its juices. How far the putrescency may be properly carried, Dr. Cullen will not determine; it may be different according to the peculiar constitution of the consumer. Some persons suffer no inconvenience from meats in a very putrescent state; but the case is otherwise in others, whose digestion is much disturbed by the smallest quantity of tainted meat,

But however all this may be, every advance in meats towards putrescency, renders them more ready to increase the spontaneous tendency of the animal fluids to that state which Dr. Cullen supposes to be always hurtful to the human constitution, as it both favours the coming on of diseases, and aggravates their symptoms and danger when they occur.

The cookery of animal subsances, is of two kinds, as it is applied in a humid form in *boiling* and *stewing;* or in a dry form, in *roasting*, *broiling*, and *baking*.

By the joint application of heat and moisture to meat in boiling, the texture is certainly rendered more tender and more soluble in the stomach; and it is only in this way that the firmer parts, as the tendinous, ligamentous, and membranous parts, can be duly softened,and their gelatinous substance rendered subservient to nutrition. Yet these effects are different according to the degree of boiling. A moderate boiling may render their texture more tender without much diminution of their nutritious quality; but if the boiling is extended to extract every thing soluble, the substance remaining is certainly less soluble in the stomach, and at the same time much less nutritious. But as boiling extracts in the first place the more soluble, and therefore the saline parts; so what remains is, in proportion, less alkalescent and less heating to the system.

Boiling in *digesters*, or vessels accurately closed, produces effects very different from boiling in open vessels. From meat cooked in the latter, there is no exhalation of volatile parts; the solution is made with great success, and if not carried very far, the meat may be rendered very tender, while it still retains its most sapid parts; and this Dr. Cullen thinks is always the most desirable state of boiled meat.

If a small quantity of water only is applied, and the heat continued long in a moderate degree, the process is called *stewing*, which has the effect of rendering the texture of meat more tender, without extracting much of the soluble parts. This, therefore, leaves the meat more sapid, and in a state perhaps the most nourishing of any form of cookery; as we learn from the admirable essays and experiments of Count Rumford, who found *very unusual effects* produced on meat, by a low degree, and long-continued action, of heat both in the dry and humid way.

The application of a dry heat in the cookery of meat is of two kinds, as it is carried on in close vessels, or as it is exposed to the air. The first of these which we shall consider is *baking*. In this practice meat has generally a covering of paste, by which any considerable exhalation is prevented, and the retention of the juices renders the meat more tender. In all cases, when the heat applied loosens, and in some measure extricates, the air without exhaling it, the substance submitted to this process is rendered more tender than when an exhalation is allowed. In *broiling* an exhalation takes place; but as the heat of a naked fire is more nearly applied, the outer surface is in some measure hardened before the heat penetrates the whole, and thereby a great exhalation is prevented, while the whole is rendered sufficiently tender; but this kind of cookery is suited to meats that are chosen to be eaten a little raw. Nearly a-kin to this is the practice of *Frying*, in which the meat, being cut into thin slices, and laid in a pan over the naked fire, the heat is applied more equally to the whole substance. But as the part of the meat lying next to the bottom of the vessel would be suddenly hardened by the heat, it is always necessary to interpose some fluid matter, usually of an oily quality, as butter. A strong heat applied to the latter renders it empyreumatic, or at least less miscible with the fluids of the stomach; so that all fried meats are less easily digested than those of any other preparation. Sometimes indeed the same thing happens to baked meats, to which an oily matter, and that only, is added to avoid the too drying heat of the oven. It is obvious that the preparations of stewing and frying may be frequently joined together; and according to there being more or less of the one or other, the effects may be imagined.

The manner of applying heat yet to be mentioned is the frequent one of Roasting; but this we reserve for a distinct article. Dr. Cullen farther observes on the state of meats, as they are presented upon the table, that they differ further only, by the difference of their sauces, or humid matters, which are employed to obviate their dryness, and to render them more agreeable to the palate. The sauces have for their basis oily matter or strong gelatinous extracts from other meat; and both are rendered more agreeable by the admixture of some other alimentary matters, and more poignant by the addition of various condiments. The effects of these in the stomach and mass of blood, will be understood from what has been said of them under the article Condimenta.

COPAI'VA BALSAM. See Balsamum Copaivæ.

COPAI'FERA OFFICINA'LIS; the systematic name of the plant from which the Copaiva balsam is obtained. See Balsamum Copaivæ.

CO'PAL, inaccurately called *gum copal*, is a gum of the resinous kind brought from New Spain, being the concrete juice of the *rhus copallinum*, a tree which grows in those parts. It comes to us in irregular masses, some of which are transparent, and of different shades as to colour, from a light yellow to a deep brown. Some pieces are whitish and semitransparent. To the smell it is more agreeable than frankincense; but has neither the solubility in water common to gums, nor in spirits of wine

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common to resins, at least in any considerable degree. In these properties it resembles amber; which has induced some to think it a mineral bitumen resembling that substance. In distillation it yields an oil, which, like mineral petrolea, is indissoluble in spirit of wine. Copal itself is soluble in the essential oils, particularly in that of lavender, but not easily in the expressed oils. It may, however, be dissolved in linseed oil by digestion, with a heat very little less than is sufficient to boil or decompose the oil. This solution, diluted with spirit of turpentine, forms a beautiful transparent varnish, which, when properly applied, and slowly dried, is very hard and durable. The only medicinal purpose to which this gum is applied, is in solution, in alcohol, as a remedy for laxities of the gums.

CO'PHOS, (Κωφος, *dumb*); the state of the deaf or dumb: also a dullness in any of the senses.

COPHO'SIS, (κοφωσις; from κωφος, *deaf*); a difficulty of hearing. It is often symptomatic of some disease. See Dysecoea.

COPPER, (*cuprum*, *quasi æs Cyprium;* so named from the island of Cyprus, whence it was formerly brought); an imperfect metal, found in the earth in various states. It is found native, possessing the red colour, malleability, and many of its other properties: this however is not quite pure, but generally mixed with a minute portion of gold or silver. This ore is of an indeterminate figure, in solid and compact masses; sometimes in plates and threads, which assume a variety of forms. It crystallizes in cubes, is then flexible, and has much metallic lustre. It is found in many parts of England and other countries. Copper ores are very numerous. Copper combined with oxygen forms *oxyd of copper*, or the *earthy copper ore*, (*mountain blue*). United to carbonic acid, it constitutes the hepatic copper ores, (*mountain green,*) &c. The compact ore of this kind is termed *malachite*.

This ore generally exhibits a very fine grass-green, or apple green colour. It is found in solid masses of an indeterminate shape, and has often a beautiful sattin-like lustre. Copper also exists mineralized by the muriatic acid, sulphuric acid, arsenic acid, &c. Mineralized with sulphur, it is called *vitreous copper ore*. Its colour is generally lead-grey. Combined with sulphur and iron, it forms the *azure copper ore* and all the varieties of copper pyrites. Mineralized with sulphur, arsenic, iron, and zinc, it constitutes the *brown* or *blendose copper ores*, of which there are many varieties.

Pure copper is of a rose-red colour, very sonorous, tenacious, ductile, and malleable; of great compactness; moderately hard and elastic. Its texture is granulated, and subject to blisters. It crystallizes in quadrilateral pyramids. Its specific gravity is between 7.788 and 8.584. When rubbed it emits a disagreeable odour. It melts at 27° of Wedgewood's pyrometer, and at a higher temperature, burns with a beautiful green flame. It is a good conductor of caloric, of electricity, and of galvanism. Exposed to the air it becomes brown, and at last green, by absorbing carbonic acid. When heated it turns blue, yellow, violet, and brown. It readily fuses with phosphorus, and unites to sulphur when finely divided by mere trituration. It does not decompose water at the temperature of ignition. It is acted on by most of the acids. Nitric acid acts on it with great vehemence. Sulphuret of potash combines with it in the dry and in the humid way. It is capable of alloying with the greater number of the metals. With zinc it forms the compound metals called brass, pinchbeck, and others: with tin, it forms bell-metal and bronze. It unites to the earths merely in vitrification. Liquid ammonia causes it to oxydate quickly when air is admitted. It decomposes muriate of ammonia and red sulphurated oxyd of mercury by heat. It is poisonous to the human constitution, though of considerable use as a medicine. See Cuprum.

Copper is procured from its ores by different processes according to the nature of those ores. If they contain much sulphur, after being pounded and washed, they undergo repeated roastings and fusion, till the metal acquires a certain degree of purity. It then is called *black copper*, which is somewhat malleable, but still contains sulphur, iron, and in general some other impurities. In order to get entirely rid of these, the copper is hastily fused with three times its weight of lead. The lead unites with the copper and quits the iron; and the rest of the metals which happen to be mixed with the copper are also expelled. The copper is afterwards refined by keeping it heated in crucibles for a considerable time, so that it may throw up all the foreign substances it still contains, in the form of scoriæ. It is examined occasionally by immersing iron rods into it, which become coloured with a small quantity of copper, and its purity is judged of by the brilliant redness of these specimens. The experimental proofs of the properties of this metal are ingeniously detailed in Mr. Accum's System of Chemistry, to which the reader is referred.

COPPERAS, a popular name given to the blue, green, and white vitriols, but principally to that of iron. The term, however, is at best a vague one, conveys a false idea, and should be exploded.

CO'R, the heart. See Heart.

CORACO-BRACHIA'LIS, (κορακο-βραχιαιος; from κοραξ, *a crow*, and βραχιον, *the arm*), or *Coraco-brachiæus;* a muscle, so called from its origin and insertion. It is situated on the humerus, before the scapula. It arises, tendinous and fleshy, from the forepart of the coracoid process of the scapula, adhering, in its descent, to the short head of the biceps; inserted, tendinous and fleshy, about the middle of the internal part of the os humeri,

near the origin of the third head of the triceps, called *brachialis externus*, where it sends down a thin tendinous expansion to the internal condyle of the os humeri. Its use is to raise the arm upwards and forwards.

CORACO-HYOIDE'US, (κορακο-υοιδαιος; from κοραξ, *a crow*. and υοειδης, *the bone called hyoides*). See Omo-hyoideus.

CORACOID PROCESS, (κορακο-ειδης; from κοραξ, *a crow*, and ειδος, *resemblance*; because it is shaped like the beak of a crow); a process, situated on the upper and anterior part of the scapula. See Scapula.

CO'RAL. See Corallium.

CORALLI'NA, (dim. of *corallium*; from κορη, *a daughter*, and αλς, *the sea*; because it is generated in the sea), *Muscus maritimus*, or *Corallina officinalis*, coralline; a marine production, resembling a small plant without leaves, consisting of numerous brittle cretaceous branches, friable betwixt the fingers, and crackling between the teeth. Powdered, it was formerly administered to children as an anthelmintine, but the colleges have long rejected it.

CORALLI'NA CORSICA'NA, called by the different names of *Helmintho-corton*, *Conferva-helmintho-cortos*, *Corallina rubra*, *Corallina melitochorton*, and *Lemitho-corton*; Corsican worm-weed; the *Fucus helmintho-corton* of De la Tourrette. This plant has gained great repute for destroying all species of intestinal worms. Its virtues are extolled by many; but those who have tried it impartially, have mostly been disappointed of its efficacy. The Geneva pharmacopœia directs a syrup to be made of this vegetable.

CORALLI'NA MELITO-CORTON. See Corallina Corsicana.

CORALLI'NA RUBRA. See Corallina Corsicana.

CORALLINE. See Corallina.

CORALLINE, CORSICAN. See Corallina Corsicana.

CORA'LLIUM A'LBUM, a hard, white, calcareous, brittle substance, the nidus of the *Madrepora oculata*, Linn. Class, *Vermes*. Order, *Lithophyta*. It is sometimes exhibited as an absorbent earth, but with no better effect than chalk or magnesia.

CORA'LLIUM RUBRUM, (κοραλλιον; from κορη, *a daughter*, and αλς, *the sea*; so named, because it is generated in the sea); red coral. It was medicinally employed, but is now rejected. It is a hard, brittle, calcareous substance, resembling the stalk of a plant, and the habitation of the *isis nobilis*, Linn. Class, *Vermes*. Order, *Zoophitæ*. When powdered, or levigated, it is exhibited as an absorbent earth to children.

CO'RCHORUS, jew's mallow, a genus in Linnæus's botany. He enumerates nine species.

CO'RCULUM, (dim. of *cor*, the heart); the heart of a seed, and rudiment of life of the future plant, attached to, and contained within, the lobes. It consists of two parts, termed by Linnæus *Plumula* and *Rostellum*. The former is the *radicula* of Grew and other naturalists. The corculum is in fact the embryo of the future vegetable; and is attached by two trunks of vessels to the lobes at their union. The first of its two parts mounts upward, and becomes the trunk. The other strikes into the ground, and is the rudiment of the root. The lobes and heart of the seed are distinctly visible in the bean, and other seeds of that class, especially after remaining some time in water or earth. The principle of life is seated either at the summit or base of the seed. On this circumstance are founded the two first classes in Cæsalpinus's method, containing trees and shrubs only.

CORDATED, in botany, resembling a heart; a term often applied to the leaves of plants.

CO'RDIA MY'XA; the systematic name of the Sebesten plant. See Sebesten.

CORDIALS, or Cardiacs; medicines which possess warm and stimulating properties, and that are usually given to raise the spirits. See Cardiaca.

COREO'PSIS, tickseed, a genus in Linnæus's botany. He enumerates twelve species.

CORIA'NDRUM, (κοριανδρον; from κορη, *a pupil*, and ανηρ, *a man*; because of its roundness, like the pupil of the human eye), coriander; the *Coriandrum sativum*, Linn. *Coriandrum fructibus globosis*. Class, *Pentandria*. Order, *Digynia*. Every part of the plant has a very offensive odour; but upon being dried the seeds have a tolerably grateful smell, and their taste is moderately warm, and slightly pungent. They possess a stomachic and carminative power, and are directed in the *Infusum tamarinda*, *cum senna*, Lond. *Infusum sennæ tartarisatum*, Lond. and some other compositions of the pharmacopœias.

CORIA'NDRUM SATI'VUM; the systematic name of the plant called *Coriandrum* in the pharmacopœias. See Coriandrum.

CORIA'RIA, myrtle-leaved sumach, a genus in Linnæus's botany. There are two species. This name is also given to the *tanner's sumach*, a species of rhus.

CORI'NDUM, a species of Cardiospermum.

CORIO'PHORA, lesser lizard-flower, a species of *Orchis*.

CO'RIS, a genus in Linnæus's botany. There is one species.

CO'RIUM, a name given by some anatomists to the dartos muscle. See Dartos.

CORK, the bark of a tree of the same name, a species of Quercus. See Quercus. To take off the bark, they make an incision from the top to the bottom of the tree, and at each extremity another round the tree, perpendicular to the first. When

stripped from the tree, which does not therefore die, the bark is piled up in a pond or ditch, and loaded with heavy stones to flatten it, and reduce it into tables: hence it is taken to be dried; and when sufficiently so, put into bales for carriage. If care be not taken to strip the bark, it splits and peels off itself; being pushed up by another bark formed underneath. The bark of cork, as well as the acorn, though not now used in medicine, are both reputed astringents, after being burnt and powdered But the chief purpose of the former is, to put into the soles of shoes, to stop bottles, &c. The Spaniards burn it to make that kind of light black we call *Spanish black*, used by painters. The Egyptians made coffins of cork; which being lined with a resinous composition, preserved dead bodies uncorrupted. The Spaniards line their walls with it, which not only renders them very warm, but keeps out moisture.

CORN, a hardened tumor of the cuticle, produced by pressure; so called, because a piece can be picked out like a corn of barley. A corn is defined by Dr. Cullen to be "a lamellated hard thickening of the cuticle." He ranks it as a genus of disease in the Class *Locales*, and Order *Tumores*. These horny excrescences grow on the feet and toes of those who wear tight shoes, and on the hands of labouring people. They resemble inverted warts, and are seated both in the cutis and cuticle, arising chiefly from pressure and attrition, and are excessively painful when rooted near a tendon. They are sometimes connected with the periosteum. The easiest and best way to get rid of them, is to take off all uneasy pressure by bolstering; and apply a piece of linen, spread with common adhesive plaster of litharge, little more than the size of the corn, which should lie close on the part for four or five days together, so as to render its surface soft; when that part which appears sodden may be pared away, but by no means so low as to touch the quick. After this the plaster is to be renewed, and the whole process repeated in five or six days, till the corn appears likely to turn out at the root, or wastes away. Soaking the part in bran and warm water, is very useful, previous to each cutting. Hog's gall, dried in the bladder, spread thin upon rag and applied to the *corn* only, it is said, has often proved efficacious. It is apt to inflame the part a little, but the corn generally softens after a few applications of this kind, and turns out at the root.

CO'RNEA OPA'CA; a name given to the sclerotic coat of the eye; because it is of a horny consistence and opake. See SCLEROTICA MEMBRANA.

CO'RNEA TRANSPA'RENS, the transparent cornea, or that portion of the sclerotic coat, through which the rays of light pass to the retina. It is so called, to distinguish it from that larger portion which is opake. See SCLEROTICA. The transparent *cornea*, (called also simply the *cornea*), consists of several strata or lamina closely united by cellular substance, and of a different texture from the former; besides, it receives no blood-vessels in the natural state. When macerated in cold water, it swells, and then its strata may be separated from each other. If it be macerated till it begin to become putrid, and is then plunged into boiling water, it readily separates from the sclerotic, being joined only by cellular substance. It is likewise thicker than the sclerotic, especially in new-born children, where its posterior surface almost touches the iris.

This portion is something more convex than the sclerotica, so that it represents the segment of a small sphere added to the segment of a greater; but this difference is not equally great in all persons. The circumference of the convex side is not circular, as that of the concave side, but transversely oval: for the superior and inferior portions of the circumference terminate obliquely; but this obliquity is more apparent in oxen and sheep, than in the human subject.

The cornea is perforated by a great number of imperceptible pores, through which a very fine fluid is continually discharged, which soon afterwards evaporates; but we discover it evidently by pressing the eye soon after death, having first wiped it very clean; for we then see a gradual collection of a very subtile liquor, which forms itself into little drops; and this experiment may be several times repeated on the same subject. It is this dew that forms a kind of pellicle on the eyes of dying persons, which sometimes cracks soon after, as is observed in the Memoirs of the Academy of Sciences, for 1721.

CORN-FLOWER. See CYANUS.

CORN-SALLAD; the *Valeriana locusta*, Linn. This is cultivated in our gardens, and included amongst the early sallads. It is a very wholesome succulent plant, possessing antiscorbutic and gently aperient virtues, but of no note as a medicine.

CO'RNU AMMO'NIS, or *Cornu arietis*; an appearance exhibited when the pes hippocampi of the human brain is cut transversely through; the cortical substance being so disposed as to resemble a ram's horn. This, Dr. Hooper says, is the true cornu ammonis, though the name is often applied by writers to the *pes hippocampi* itself.

CO'RNU ARIE'TIS. See CORNU AMMONIS.

CO'RNU CE'RVI; hartshorn. The horns of several species of stag, as the *cervus aloes*, *cervus dama*, *cervus elaphus*, and *cervus taranda*, are used medicinally. Those of the *cervus elaphus*, however, are preferred in the British pharmacopœias. Boiled, they impart to the water a nutritious jelly, which is frequently served at the table, and also given in debilitating diseases. But the chief use of these horns is for calcination and distillation. They af-

ford the *liquor volatilis*, *sal*, *et oleum*, *cornu cervi*, and also the *phosphas calcis* or burnt hartshorn; which are in frequent use as important articles in the materia medica.

CO'RNU CE'RVI CALCINA'TUM. See CORNU CERVI USTUM.

CO'RNU CE'RVI U'STUM, called by the Edinburgh College, *phosphas calcis*, *burnt hartshorn* or *phosphate of lime*. This is prepared by burning pieces of hartshorn till they become perfectly white, and then reducing them to a very fine powder. The horns of other animals, however, are generally employed in this operation; and those are usually appropriated for this purpose which have previously undergone distillation. A sufficient fire, and the free admission of air, alone are necessary. Too violent a heat makes their surface undergo a kind of fusion and vitrification, which both prevents the internal parts from being completely burnt, and renders the whole less soluble. If the pieces be laid on some lighted charcoal, spread on the bottom of the grate, they will be burnt to whiteness, still retaining their original form. Merat Guillot found hartshorn to consist of 27. gelatine, 57.5 phosphate of lime, 1. carbonate of lime, and that there was a loss of 14.5, probably water. As the gelatine is destroyed, and the water expelled, that which remains is phosphate of lime, mixed with less than two *per cent.* of carbonate of lime. In the bones of animals there has also been discovered phosphate of magnesia.

Burnt hartshorn was formerly considered an absorbent earth, but a more accurate analysis of it has occasioned that idea to be laid aside; and its use has been suggested as a remedy in rickets, a disease in which the deficiency of the natural deposition of phosphate of lime in the bones, seems to be the essential or at least most striking symptom. With this view, M. Bonhomme gave it to the extent of half a scruple, mixed with phosphate of soda, in several cases, with apparent success.

This remedy enters the following officinal preparations, viz: *Decoct. cornu cervi*, and *Pulv. opiatus*, Lond. *Phosphas sodæ*, Edin.

CO'RNUA, horny excrescences, which most commonly form on the joints of the toes. Similar diseased productions have been known to arise on the head and other parts of the human body.

CO'RNUA U'TERI, in comparative anatomy, the horns of the uterus. The womb is so divided in some quadrupeds, as to form cavities resembling horns. It is especially so in the mare.

CORNUCO'PIÆ, a genus in Linnæus's botany. He enumerates two species.

COR'NUS, the cornel tree, or DOG-WOOD, a genus in Linnæus's botany. Of this species there are nine.

CORNU'TIA, a genus in Linnæus's botany. There is but one species.

COROLI'STÆ, a name by which Linnæus distinguishes those systematic botanists who have arranged vegetables from the regularity, figure, number, and other circumstances, of the petals, or beautiful coloured leaves of the flower. The best systems of this kind are those of Rivinus and Tournefort. The former proceeds upon the regularity and number of the petals; the latter, with much more certainty, on their regularity and figure.

CORO'LLA, in botany, the most conspicuous part of a flower, surrounding the sexual organs, and composed of one or more flower-leaves, most commonly called *petals*, to distinguish them from the leaves of the plant: according as there is one, two, or three of these petals, the corolla is said to be monopetalous, dipetalous, tripetalous, &c.

CORO'LLULA, a term used by botanists to express the little partial flowers which make up the compound ones.

CORO'NA, in botany, the little crown which adheres to many kinds of seeds, and which, serving them as wings, enables them to disperse. It is exemplified in the dandelion, thistle, and many other plants.

CORO'NA GLA'NDIS; the round, prominent margin, terminating the glans penis, and on which the odoriferous glands are situated. See PENIS.

CORO'NA IMPERIA'LIS, CROWN-IMPERIAL; a species of *Fritillaria*.

CORO'NA SO'LIS. So Tournefourt called the HELIANTHUS of Linnæus.

CORO'NA VE'NERIS. Venereal blotches, encircling the forehead, are so termed. See LUES VENEREA.

CORONAL SUTURE, (from *corona*, a crown or garland: so named, because the ancients wore their garlands in its direction), *sutura coronalis*; that suture of the skull, which extends from one temple across to the other, uniting the two parietal bones with the frontal. See SUTURES.

CORONA'RIA VA'SA, coronary vessels. The arteries and veins of the heart and stomach. See HEART, and STOMACH. The term coronary is here given, from *corona*, a crown, as surrounding or embracing any part in the manner of a crown.

CORONA'RIÆ, in botany, the 10th order of plants in Linnæus's Fragments of a natural method. Under this name, instead of the more obvious one *liliaceæ*, Linnæus collects a great number of genera, most of which furnish very beautiful garden-flowers, viz. albuca, cyanella, fritillaria, helonias, hyacinthus, hypoxis, lilium, melanthium, ornithogalum, scilla, tulipa, agave, aletris, aloe, anthericum, asphodelus, bromelia, burmannia, hemerocallis, polianthes, tillandsia, veratrum, yucca.

CORONARY LIGAMENT, the coronary ligament of the radius; a species of ligamentary hoop, embracing the circumference of the head of that bone, reaching from one side of the small late-

ral sigmoid, or transverse, cavity of the ulna, to the other, in an arch, which is about three fourths of a circle. It is in substance nearly as solid as a cartilage; which modern anatomists, indeed, rather consider it to be. It connects the radius very closely to the ulna, yet admits of the pronation and the supination of the arm.

CORONI'LLA a genus in Linnæus's botany. To this genus Linnæus adds the EMERUS or *Scorpion Sena*, and SECURIDACA or *Hatchet-Vetch*. He enumerates eleven species.

CORONOID, (*coronoideus*, κορωνοειδης; from κορωνυ, *a crow*, and ειδος, *likeness)*, an epithet applied to those processes of bones that have any resemblance to a crow's beak.

CORO'NOPUS, swine's cresses, a species of COCHLEARIA. This is also a name for the buck's horn plantain, or star-of-the-earth, a species of PLANTAGO.

CO'RPORA CAVERNO'SA PE'NIS; two ligamentary and very pliant tubes, united laterally to each other, through the greatest part of their length, and solid at their two extremities. Two of these are connected together, and rounded like the end of a finger; the other two divaricate, like the branches of the Greek Υ; and diminishing gradually in size after the divarication, terminate in an oblique point. These divaricated and pointed extremities may be called the *roots*, and the round extremities the *heads*. These two bodies are almost cylindrical, being round, and of an equal diameter from the roots to the heads, where they are in some measure conical. The ligamentary substance of their sides is elastic, and composed of fine close fibres, which are partly transverse, and partly more or less oblique.

The cavity of these ligamentary tubes is entirely filled by strong cellular or cavernous substance, which does not seem to be a continuation of the substance of the sides. These cells communicate with each other, and are always more or less full of blood, resembling very much the cellular substance of the spleen, only with this difference, that the sides of the cells are thicker, in these cavernous bodies, and without any additional substance.

By the union of the two corpora cavernosa, two external grooves are formed; one on the upper side, the other on the lower. The lower groove is something broader than the upper; and it is filled, through its whole length, by a third tube, narrower than the corpora cavernosa, called the *urethra*; which will be described under that head. The roots of the corpora cavernosa are fixed, each to the edge of the small ramus of the ischium and os pubis. They meet at the symphysis of the ossa pubis, where each of them becomes a cylindrical tube, and unites with the other in the manner already said. The heads, or rounded extremities, join the basis of a distinct body, called the *glans* (see GLANS PENIS), which is an expansion of the urethra, and closely united to it in the manner explained under that head.

By the union of the corpora cavernosa from their roots to their round extremities or heads, a particular septum is formed by the transverse fibres of both. Between the fibres of this septum several small void spaces are left, by which the corpora cavernosa communicate with each other; and therefore, by blowing into one of them, we presently inflate the other. Toward the rounded extremities, the septum diminishes every way.

CO'RPORA FIMBRIA'TA; a name given to the flattened terminations of the posterior crura of the fornix of the brain; which turn round into the inferior cavity of the lateral ventricle, and end in the *pedes hippocampi*. See FORNIX.

CO'RPORA OLIVA'RIA; the two external prominences of the medulla oblongata, that are shaped somewhat like an olive. See MEDULLA OBLONGATA.

CO'RPORA PYRAMIDA'LIA; two internal prominences of the medulla oblongata, which are more of a pyramidal shape than the former. See MEDULLA OBLONGATA.

CO'RPORA QUADRIGE'MINA. See TUBERCULA QUADRIGEMINA.

CO'RPORA STRIA'TA; portions of the cerebrum, which have got that name, because, on cutting them, a great number of white and ash-coloured lines are seen disposed alternately, which are only the transverse section of the medullary and cortical laminæ, mixed together, in a vertical position, in the basis of the brain, as appears evidently by incisions made from above downward. These two eminences are of a greyish colour on the surface, oblong, roundish, pyriform, and larger on the fore than on the back part, where they are narrow and bent.

They lie in the bottom of the superior cavity of the lateral ventricles, which they resemble in some measure in shape, their anterior parts being near the septum lucidum, from which they gradually separate as they run backward, and diminish in size. They are in reality the convex bottoms of the ventricles; and it is at the lower part of the interstice, between the largest portions of them, that we observe the greatest transverse cord, named *the anterior commissure of the cerebrum*, which we mentioned when describing the anterior pillar of the fornix callosus. This cord communicates more particularly with the bottom of the corpora striata, by a turn toward each side.

CORPULENCY, the state of a person too much loaded with flesh or fat. Corpulency is not only a disease of itself, in which case it is usually called *obesity* (see OBESITY), but it also contributes to other diseases, particularly the apoplexy. It was

held infamous among the ancient Lacedæmonians. Sennertus mentions a man that weighed 600 pounds, and a maid 36 years of age who weighed 450. Mr. Bright of Malden, who died at the age of 29 years, in 1750, weighed 616 pounds. Chiapin Vitelli, Marquis of Cerona, a noted Spanish general in his time, from an excessive corpulency, is said to have reduced himself, by drinking vinegar, to such a degree of leanness, that he could fold his skin several times round him. From one to four drachms of Castile soap, taken at bed-time, is strongly recommended, with a view of reducing corpulency, by Dr. Flemyng.

CO'RPUS, in anatomy, a term applied to several parts of the animal structure; as *corpus callosum*, *corpus cavernosum*, *corpus spongiosum*, &c.

CO'RPUS ANNULA'RE; a synonyme of pons Varolii. See PONS VAROLII.

CO'RPUS CALLO'SUM, called by former anatomists, *Commissura magna cerebri;* the white medullary part joining the two hemispheres of the brain, and coming into view under the falx of the dura mater, when the hemispheres are drawn from each other. It is a middle portion of the medullary substance, which, under the inferior sinus of the falx, and also a little towards each side, is parted from the mass of the cerebrum, to which it is simply contiguous, from one end of that sinus to the other; so that, at this place, the edge of the inside of each hemisphere only lies on the corpus callosum, much in the same manner as the interior and posterior lobes lie on the dura mater. Both extremities of this medullary body terminate by a small edge bent transversely downward.

The furface of the corpus callosum is covered by the pia mater, which runs in between the lateral portions of this body, and the lower edge of each hemisphere. Along the middle of its surface, from one end to the other, a kind of raphe is formed, by a particular intertexture of fibres crossing each other. This raphe is made more perceivable by two small medullary cords, which accompany it on each side, and adhere closely to the transverse fibres. The same striated appearance is to be observed in the inner parts of this substance.

CO'RPUS LUTEUM; the granulous papilla which is found in that part of the ovarium of a woman, from whence an ovum had proceeded; hence their presence determines that the female has been impregnated; and the number of the *corpora lutea* corresponds with the number of impregnations. It is, however, asserted by a modern writer, that *corpora lutea* have been detected in young virgins, where no impregnations could possibly have taken place. If the ovarium be injected in the latter months, the corpus luteum will appear to be composed chiefly of vessels. A portion of it, however, in the centre, will not be filled; whence there is reason to suspect that it is a cavity, or that it contains a substance not yet organized.

CO'RPUS MUCO'SUM. See RETE MUCOSUM.

CO'RPUS PAMPINIFO'RME, (from *pampinus*, a tendril, and *forma*, likeness; resembling a tendril); a term applied to the spermatic chord, and thoracic duct also. It is the plexus of veins, surrounding the spermatic artery, in the cavity of the abdomen.

CO'RPUS RETICULA'RE. See RETE MUCOSUM.

CO'RPUS SPONGIOSUM URETHRÆ, called by different anatomists, *substantia spongiosa urethræ*, and *corpus spongiosum penis.* This substance originates before the prostate gland, surrounds the urethra, and forms the *bulb;* then proceeds to the end of the corpora cavernosa, and terminates in the *glans penis*, which it forms. See GLANS PENIS.

CORPUSCLE, a minute particle, or physical atom; being such as a natural body is made up of. By this word is not meant the elementary particles, nor the hypostatical principles, of chemists; but such particles, whether of a simple or compound nature, whose parts will not be dissolved nor dissipated by ordinary degrees of heat.

CORROBORANTS, or ROBORANTS; medicines, or whatever else gives strength to the body, as bark, wine, beef, cold bathing, &c. See ASTRINGENTIA.

CORRO'SIVA, (from *corrodo*, to eat away); corrosives or caustics. See ESCHAROTICS.

CORROSIVE SUBLIMATE. See HYDRARGYRUS MURIATUS.

CORRUGATION, the contraction of any part into folds or wrinkles; as happens to the scrotum when contracted by cold applications.

CORRUGA'TOR SUPERCILII, (from *corrugo*, to wrinkle); the *Musculus Supercilii*, of Winslow; and *Musculus Frontalis verus, seu Corrugator*, of Douglas. It arises fleshy from the internal angular process of the os frontis, above the joining of the os nasi, and nasal process of the superior maxillary bone: from thence it runs outwards, and a little upwards. It is inserted into the inner and inferior fleshy part of the occipito-frontalis muscle, where it joins with the orbicularis palpebrarum, and extends outwards as far as the middle of the superciliary ridge. Its use is to draw the eye-brow of that side towards the other, and make it project over the inner canthus of the eye. When both act, they pull down the skin of the forehead, and make it wrinkle, particularly between the eyebrows.

CO'RTEX, bark. See BARK. This term is very generally given, by way of eminence, to the Peruvian bark. See CINCHONA.

CO'RTEX ANGELI'NÆ; the bark of a tree growing in Grenada. A decoction of it is recommended, by some writers, as a vermifuge. It excites tormina, similar to jalap, and operates by purging, like other drastic remedies.

CO'RTEX ANGUSTU'RÆ. See ANGUSTURÆ CORTEX,

CO'RTEX BELA-AYE. See BELA-AYE CORTEX.

CO'RTEX CANE'LLÆ MALABA'RICÆ. See CASSIA LIGNEA.

CO'RTEX CARDINALIS DE LUGO, a name for the Peruvian bark. See CINCHONA.

CO'RTEX CHI'NÆ RE'GIUS. See CINCHONA CORTEX PERUVIANUS FLUVUS.

CO'RTEX CHI'NÆ SURINAME'NSIS. This bark is remarkably bitter; and some reckon it preferable to the other species in intermittent fevers.

CO'RTEX CHI'NCHINÆ. See CINCHONA.

CO'RTEX ELUTHE'RIÆ. See CASCARILLÆ CORTEX.

CO'RTEX GEOFFROY'Æ JAMAICE'NSIS, the bulge water-tree bark. It is the bark of the *Geoffroya jamaicensis; inermis foliolis lanceolatis*, of Swartz. It has been used in Jamaica, with great success, as a vermifuge remedy.

CO'RTEX LAVOLA; a kind of bark supposed to be the produce of the tree which affords the *anisum stellatum*. Its virtues are similar to these last in most respects.

CO'RTEX MAGELLA'NICUS. See WINTERANUS CORTEX.

CO'RTEX MASSOY; a remedy which is said to be the produce of New Guinea, where it is beaten into a pultaceous mass with water, and rubbed upon the abdomen to allay tormina of the bowels. It partakes of the smell and flavour of cinnamon, and contains an essential oil.

CO'RTEX PERUVIA'NUS. See CINCHONA.

CO'RTEX PERUVIA'NUS RU'BER. See CINCHONA.

CO'RTEX POCGEREBÆ, a kind of bark sent from America; and said to be serviceable in diarrhœas, dysenteries, and hepatic affections.

CO'RTEX WINTERA'NUS. See WINTERANUS CORTEX,

CO'RTICAL SUBSTANCE, synonymous with *Cineritious substance*. The external substance of the brain is of a darker colour than the internal, and surrounds the medullary substance, as the bark does the tree; hence it is termed *cortical*. See CEREBRUM, and KIDNEY.

CORTU'SA, BEAR'S EAR SANICLE; a genus in Linnæus's botany. There are two species.

CORY'DALES, (from κορος, *a helmet*), in botany, the 24th order in Linnæus's Fragments of a Natural Method. It consists of plants which have irregular flowers, somewhat resembling a helmet or hood. These plants are mostly herbaceous and perennial. The genera are, Epimedium, *Barrenwort;* Hypecoum; Leontice, *Lion's leaf;* Melianthus, *Honey-flower;* Pinguicula, *Butterwort*, or *Yorkshire Sanicle;* Utricularia, *Water-milfoil;* Fumaria, *Fumitory;* Impatiens, *Balsam*, or *Female Balsamine;* Monnieria.

CO'RYLUS, nut-tree, a genus in Linnæus's botany. There are two species.

CORY'MBIUM, a genus in Linnæus's botany. There are four species.

CORY'MBUS, in botany, properly signifies a cluster of ivy berries; but it is used to signify a mode of flowering, in which the lesser or partial flower-stalks are produced along the common stalk on both sides; and though of unequal lengths, rise to the same height, so as to form a flat and even surface at the top.

CORYNOCA'RPUS, a genus in Linnæus's botany. There is but one species.

CO'RYPHA, a genus in Linnæus's botany. There are two species.

CORY'ZA, (κορυζα; from καρα, *the head*, and ζεω, *to boil*), an increased discharge of mucus from the nose. See CATARRHUS.

COSME'TICA, (κοσμητικα; from κωσμεο, *to beautify)*, cosmetics; washes, or other applications that preserve the beauty and smoothness of the skin.

CO'STA, (*a custodiendo;* because the ribs surround and defend the vital parts); a rib. The ribs are four and twenty in number, twelve on each side of the thorax. See RIBS.

CO'STÆ, in botany, the nerves of the leaves, or the long fibres which branch lengthways through them, are called their ribs.

CO'STUS AMA'RUS. See COSTUS ARABICUS.

CO'STUS ARA'BICUS, (*costus* of κοςος; from KASTA, Arab.) The root of this tree possesses bitter and aromatic virtues, and is considered as a good stomachic. Formerly there were two other species, the *bitter* and *sweet*, distinguished for use. At present the Arabic only is known, and that is seldom employed, at least in Britain.

CO'STUS DULCIS. See COSTUS ARABICUS.

COTTON, a vegetable substance wrought into cloathing: and, in that state, very generally employed. See CLOATHING.

CO'TULA FŒ'TIDA, (dim. of *cos*, a whetstone, from the resemblance of its leaves to a whetstone: or from κοτλυ, *a hollow)*, *Chamæmelum fœtidum;* Mayweed, or Stinking camomile. It is the *Anthemis cotula; receptaculis conicis, paleis setaceis, seminibus nudis*, Linn. This plant has a very disagreeable smell; the leaves, a strong, acrid, bitterish taste; the flowers, however, are almost insipid. It is said to have been useful in hysterical affections, but is very seldom employed in this country.

COTYLE'DON, in botany, the side lobe of the seed in vegetables. It is of a porous substance and perishable, answering the purpose of the placenta in the animal economy, and hence the disposition of the *cotyledons* is called *placentation*, in botanical language.

COTYLE'DON, navel-wort, kidney-wort, or

wall penny-wort, a genus in Linnæus's botany. He enumerates fifteen species.

COTYLE'DON, a species of Saxifraga.

COTYLE'DONES, are little glands dispersed over the outermost membrane of the fœtus. They are said to separate a nutritious juice, and are thus named from their resemblance to the herb penny-wort, in Latin *Cotyledon*. See Chorion.

COUCH-GRASS. See Gramen caninum.

COUCHING, an operation performed in the case of a Cataract. See Cataract.

COUGH, a violent, often involuntary, and sonorous expiration, suddenly expelling the air through the contracted glottis. Dr. Cullen observes, that it is generally a symptomatic catarrh. It is excited by any acrid substance, either chemically or mechanically applied to those passages through which the air enters. The trachea being lined with a membrane of exceeding sensibility, it cannot bear even the mildest stimulus, such as a drop of cold water, without throwing the muscles serving for respiration, into a violent convulsion. Hence the air is expelled with a force sufficient to carry along with it the irritating substance; and thus a cough becomes not only useful, but indispensably necessary for the preservation of life; as this effort frees the lungs from every kind of stimulating matter, or foulness, which might otherwise be attended with suffocation. A cough is, therefore, an almost inseparable companion of every inflammation of the lungs, as well as every difficulty of breathing (see the articles Catarrh and Dyspnœa); nay, it frequently takes place, when the purest air, much more when smoke, or other irritating vapours, enter an excoriated or too sensible windpipe, and its branches. It may also arise, by sympathy, from too great an irritability of the nervous system, or even of some particular part, such as the ear; from worms and impurities in the first passages; obstructions of the abdominal viscera; acrimony clogging the glands, and originating frequently in a scrophulous disposition; hysteric weakness; a determination of the circulation to the lungs, &c.

The *cough of infants*, in general, proceeds from an affection of the stomach, in consequence of too viscid and superfluous food, as cakes, gingerbread, confectionary, &c. It is accompanied either with a voracious appetite, or a total want of it; difficulty of breathing, a tumefied hard belly, nausea, and often vomiting. The breath and excrements of such children are unusually fœtid; they seldom cough from the breast, but make efforts to vomit, and throw up a viscid phlegm; in consequence of which they remain easy for a longer time than usual. The tongue is always impure, and the cough increases in violence after meals. For this troublesome complaint, there are no better remedies than gentle emetics and laxatives. Dr. Willich says, a child under one year old, may occasionally take a large tea-spoonful of the following mixture:

℞ Syr. scillæ,
Aq. rosæ, aa ℥j.
Pulv. rhabarb. gr. iv.
Pulv. ipecac. gr. ij.
Misce fiat Mistura.

The dose may be repeated every half hour, for three or four times, till it produces vomiting.

In general, however, it is sufficient to give as much vin. antim. tart. as will vomit in the first instance, and afterwards to continue the same twice or thrice a day in doses so small as not to occasion any sickness. To the dose given at night, a drop or two of tin. opii may also be added.

The *convulsive cough of adults*, likewise arises from a disordered state of the organs of digestion, and is frequently the lot of tipplers in spirituous liquors, and habitual drunkards. At its commencement there is little or no expectoration; and an inclination to vomit generally precedes a fit of coughing. For the treatment of this malady, the warm pectoral remedies and stimulating gums (see Pectorals), are most effectual; but, if the paroxysms should be so severe as to threaten suffocation, Dr. Willich advises, from experience, small doses of calcined zinc, from half a grain to one grain at a time, to be taken in a spoonful of luke-warm water, and to be repeated, if necessary, every five or ten minutes.

It is a common error, to suppose that coughs may be cured by the usual mode of administering oily, diluent, and demulcent remedies. At first, indeed, such medicines may be serviceable, by allaying the irritation on which the cough seems to depend. But, as the compounds of oil, spermaceti, &c. easily turn rancid, and, even in a fresh state, impair the appetite, we cannot but consider them as extremely precarious: hence most persons prefer the chewing of extract of liquorice, gum arabic, and such like substances, to all *liquid* preparations. These, however, have a very transient effect; other and more effectual means being necessary to remove the cause of the disease. It may be proper to mention, in this place, a remedy which is highly praised by the physicians of Hamburgh, as being of great use in all obstinate *coughs*. This medicine is a simple decoction of the *Calaguala*, a root lately imported from South America, and now universally preferred to the seneka, or *rattle-snake root*, which was formerly used for similar purposes. Dr. Unzer directs two drachms of the calaguala to be boiled in a quart of water, till the fourth part is evaporated, and to drink several cups of the strained decoction, instead of tea. When taken sufficiently strong, and for a proper length of time, it evidently acts on the skin and kidneys. He cautions us, however, against a spurious species of that root, which is fre-

quently sold by druggists, instead of the genuine; and an account of which is given by M. Galmetti, an Italian writer.

COUNTER-OPENING, *contra-apertura;* an opening made in any part of an abcess opposite to one already in it. This is often made by surgeons in order to afford a readier egress to the collected pus.

COUNTER-STROKE. See CONTRA-FISSURA.

COU'RAP, the modern name for a distemper very common in Java, and other parts of the East Indies. It is a sort of herpes on the breasts, face, arm-pits, and groins. The itching is almost perpetual, and the scratching is followed by great pain, and a discharge of matter. *Courap* is a general name for any sort of itch.

COU'SCOUS; the African name for a sort of paste made of the flour of millet, into which some flesh is infused, and when eaten, a small quantity of *lalo* is also put. It is much used as food about the river Senegal.

COWHAGE. See DOLICHOS.

COWPER'S GLANDS, (*Cowperi glandulæ;* named from the anatomist who first described them); three large muciparous glands of the male, two of which are situated before the prostate gland, under the acceleratores muscles, and the third more forward, before the bulb of the urethra. They excrete a fluid, similar to that of the prostate gland, during the venereal orgasm.

CO'XA, a name for the ischium; sometimes also called, the os coccygis. See COCCYGIS.

CRAB-LICE, a troublesome kind of vermin, which stick so fast with their claws to the skin as to render it difficult to dislodge them. Being viewed with a glass they nearly resemble the small crab-fish; whence they obtained their popular name. They are also called *pluctulæ*, *marpiones*, *petolæ*, and *pessolatæ.* They usually infest the armpits and *pudenda.* They will be quickly destroyed, and drop off, upon the application of a little quicksilver ointment, or a weak solution of muriated mercury, which is more cleanly in the application.

CRAB'S-EYES. See CANCER.

CRAB'S-CLAWS. See CONTRA-FISSURA.

CRAB-YAWS, a name, in Jamaica, for a kind of ulcer on the soles of the feet, with hard callous lips, so hard that it is difficult to cut them. The unguent. hydrarg. is the remedy employed.

CRADLE, a well-known machine in which infants are rocked to sleep, to the great detriment of their health and senses.

CRADLE, in surgery, a case of wood in which a broken leg is laid after being set. The same term is used to signify a light kind of arched frame or tilt, intended merely to prevent the bed-clothes from pressing upon the limb.

CRA'MBE MARI'TIMA; the systematic name for the sea kale. See SEA KALE.

CRAMP (from the German *krampe*, which signifies the same); a kind of spasm, which contracts the muscles of the legs, feet, &c. with a violent though sometimes transitory pain. A glass of tar-water, drank night and morning, has been recommended; and, by old women, a rod of brimstone, held in the hand. The best remedy is to stretch out the affected limb, powerfully and resolutely, for some time together, and to apply friction with a flesh-brush. Aged, sedentary, and infirm persons, are peculiarly liable to this complaint, for which a variety of remedies has been tried, with occasional success. Sometimes a garter applied tightly round the limb affected, will speedily remove the complaint. When it is more obstinate, a brick should be heated, wrapped in a flannel bag, and placed at the foot of the bed, against which the person troubled with the cramp may place his feet. The brick will remain warm the whole night, and thus prevent any return. No remedy, however, is equal to that of diligent and long-continued friction.

CRANE'S-BILL, a sort of forceps formerly used by surgeons; so called from its resemblance in shape to the bill of a crane.

CRA'NIUM, (κρανιον, *quasi* καρανιον; from καρα, *the head*); the SKULL, or superior part of the head. The cranium consists of several pieces, which form a vaulted cavity, for lodging and defending the brain and cerebellum, with their membranes, vessels, and nerves. The cavity of the cranium is proportioned to its contents. Hence such a variety in its size is observed in different subjects; and hence it is neither so broad nor so deep at its fore-part, in which the anterior lobes of the brain are lodged, as it is behind, where the large posterior lobes of the brain, and the whole cerebellum, are contained.

The roundish figure of the skull, which makes it more capacious, and better able to resist external injuries, is chiefly owing to the equal pressure of these contained parts as they grow and increase before it is entirely ossified. It is to be observed, however, that the sides of the cranium are depressed below a spherical surface by the strong temporal muscles, whose action hinders here the uniform protrusion of the bones, which is more equally performed in other parts where no such large muscles are. In children, whose muscles have not acted much, this depression is not so remarkable; and therefore their heads are much rounder than in adults. These natural causes, differently disposed in different people, produce a great variety of shapes in skulls, which is still increased by the different management of the heads of children when very young: so that, Dr. Monro says, one may know a Turk's skull by its globular figure, a German's by its breadth and flatness of the occiput, Dutch and English by their oblong shapes, &c. Two advantages are reaped from this flatness of the

sides of the cranium, viz. the enlargement of our sphere of vision, and more advantageous situation of our ears for receiving a greater quantity of sound, and for being less exposed to injuries.

The external surface of the upper part of the cranium is very smooth and equal, being only covered with the *pericranium*, the thin frontal and occipital muscles, their tendinous aponeuroses, and with the common teguments of the body; while the external surface of its lower part has numerous risings, depressions, and holes, which afford convenient origin and insertion to the muscles that are connected to it, and allow safe passage for the vessels and nerves that run through and near it.

The internal surface of the upper part of the skull is commonly smooth, except where the vessels of the dura mater have made furrows in it, while the bones were soft. It is necessary to be cautious when we trepan here, lest, in sawing or raising the bone, where such furrows are, we wound these blood-vessels. In the upper part of the internal surface of some skulls, there are likewise pits of different magnitudes and figures, which seem to be formed by some parts of the brain being more luxuriant and prominent than others. In these pits the skull is so much thinner than any where else, that it is often rendered diaphanous, the two tables being closely compacted without a diploë; the want of which is supplied by vessels going from the dura mater into a great many small holes observable in the pits. These vessels are larger, and much more conspicuous than any others that are sent from the dura mater to the skull; as evidently appears from the drops of blood they pour out, when the skull is raised from the dura mater in a recent subject; and therefore they may furnish a sufficient qnantity of the fluids necessary to prevent the brittleness of this thin part. The knowledge of these pits should teach surgeons to saw cautiously and slowly through the external table of the skull, when they are performing the operation of the trepan; since, in a patient whose cranium has these pits, the dura mater and brain may be injured, before the instrument has pierced near the ordinary thickness of the table of the skull. The internal base of the skull is extremely unequal, for lodging the several parts and appendices of the brain and cerebellum, and allowing passage and defence to the vessels and nerves that go into or come out from these parts.

The bones of the cranium are composed of two tables, and intermediate cancelli, commonly called their *diploë*. The external table is thickest; the inner, from its thinness and consequent brittleness, has got the name of *vitrea*. Whence we may see the reason of those mischievous consequences which so often attend a collection of matter in the diploë, either from an external or internal cause, before any sign of such a collection appears in the teguments which cover that part of the skull where it is lodged.

The diploë has nearly the same texture and uses in the skull with the cancelli in other bones. See Diploe.

The cranium consists of eight bones, six of which are said to be proper, and the other two are reckoned common to it and to the face. The six proper are the *os frontis*, two *ossa parietalia*, two *ossa temporum*, and the *os occipitis*. The common are the *os ethmoides* and *sphenoides*.

The *os frontis* forms the whole fore-part of the vault; the two *ossa parietalia* form the upper and middle part of it; the *ossa temporum* compose the lower part of the sides; the *os occipitis* makes the whole hinder part, and some of the base; the *os ethmoides* is placed in the fore-part of the base, and the *os sphenoides* in the middle of it.

CRA'SIS, (*κρασις*; from *κεραννυμι*, *to mix*); a term applied to the humours of the body, when there is such an admixture of their principles as to constitute a healthy state. Hence, in dropsies, scurvy, &c. the crasis, or healthy mixture of the principles of the blood, is said to be destroyed.

CRASSAME'NTUM, (from *crassus* thick). See Blood.

CRA'SSULA, (from *crassus*, thick; so named from the thickness of its leaves). See Faba crassa.

CREAM, the most oily part of milk: it is specifically lighter than the other constituents, collects and floats on the surface, whence it is generally skimmed, in order to separate effectually the caseous and serous parts employed for the making of *Butter* and *Cheese*. See those Articles.

Cream is an agreeable and very nourishing article of food, when fresh; but too fat and difficult to be digested by persons of a sedentary life, or possessed of a weak stomach. It is nevertheless of considerable service in medicine, as a lenient and palliative application to tetters and erysipelas, which are attended with pain and itching.

CREAM OF TARTAR. See Tartris potassæ acidulus.

CREMA'STER, (*κρεμαστηρ*, from *κρεμαω*, to *suspend*), a muscle of the testicle, improperly termed *a coat*. It is a thin fleshy plane, which runs down, round the vagina of the spermatic chord, and terminates in the tunica vaginalis of the testicle. It surrounds almost the whole vagina, and afterwards expands itself on the upper and external part of the tunica vaginalis, in which it is inserted and lost. It arises partly from the ligamentum Fallopii, but chiefly from the lower edge of the internal oblique muscle of the abdomen. It is covered by a very fine cellular membrane, detached from the outside of the aponeurosis of the obliquus externus, round the opening commonly called the *ring*. This membrane is lost in the cellular substance of the inside

of the dartos. Hence we see, that the cremaster is rather a muscle of the tunica vaginalis than a particular coat. Those among the ancients who believed it to be a coat, called it *tunica crythroides*, from ερυθρος, which signifies *red*; but, it is well known, that this muscle is not always red, neither is that colour essentially necessary to fleshy fibres.

CRENATUM, (from *crena*, a notch), in botany, *crenated*; having the edge cut with angular or circular incisures, not inclining to either extremity. When the edge of a leaf is cut into angular teeth, it is called *acutely crenate*; when into segments of small circles, instead of angular teeth, it is said to be *obtusely crenate*; when the larger segments have smaller ones upon them, the leaf is then said to be *doubly crenate*. The same term is applied to the *corolla*, and *nectarium*, in some cases.

CRE'PIS, bastard HAWKWEED; a genus in Linnæus's botany. He enumerates sixteen species.

CREPITATION, (from *creps*, to crack); that noise which some salts make over the fire in calcination; called also *detonation*. This term is also used in surgery, for the noise made by the ends or pieces of bones, when the surgeon moves a limb to assure himself, by his ear, of the existence of a fracture.

CRE'PITUS, a crackling of the joints, from a defect of synovia, or other causes. Also a noisy discharge of air from the anus.

CRE'PITUS LU'PI. See BOVISTA.

CRESCE'NTIA, the CALABASH TREE; a genus in Linnæus's botany. There are two species, and three varieties.

CRE'SSA, a genus in Linnæus's botany. There is but one species.

CRESS, WATER. See NASTURTIUM AQUATICUM.

CRE'TA, chalk. (See LIME and CARBONAS CALCIS). The colleges have retained this remedy in their pharmacopœias. Its preparation is directed among *the more simple preparations*. See CRETA PRÆPARATA. It is employed in the preparation of the Ammonia, or volatile alkali, and of alum. It is rubbed into a fine powder with mercury, forming the hydrargyrus cum creta. It enters the *Mistura cretacea*; the *Pulvis e chelis cancrorum compositus*; the *Pulvis contraycrvæ compositus*; the *Pulvis e creta compositus*; the *Pulvis e creta compositus cum opio*; and the *Trochisci e creta*. These formulæ will be found in the Edinburgh new Dispensatory.

CRE'TA PRÆPARA'TA, prepared chalk; a washed carbonate of lime, possessing antacid qualities. It is exhibited in the form of electuary, mixture, or bolus, in pyrosis, cardialgia, acidities of the primæ viæ, diarrhœa, &c. It has been preposterously recommended as an antidote against white arsenic, over which it can have no other decomposing power, than that of a weak alkali.

CRETACEOUS ACID, a name for the *carbonic acid*, or fixed air.

CRETE, DITTANY OF. See DICTAMNUS CRETICUS.

CRIBRIFO'RME OS, (*cribriformis*; from *cribrum*, a sieve, and *forma*, likeness; because it is perforated like a sieve). The ethmoid bone is so called. See ETHMOIDES.

CRI'CO, (from κρικος, *a ring*). In anatomy, the names compounded of this word, belong to muscles which are attached to the cricoid cartilage.

CRICO-ARYTÆNOIDÆ'US LATERA'LIS, (from κρικος, *a ring*, αρυταινα, *an ewer*, and ειδος, *shape*); a muscle which arises fleshy from the cricoid cartilage laterally, where it is covered by part of the thyroid, and is inserted into the side of the base of the arytænoid cartilage near the former. Its use is to open the rima glottidis, by pulling the ligaments from each other.

CRICO-ARYTÆNOIDÆ'US POSTI'CUS. This muscle arises fleshy from the back part of the cricoid cartilage, and is inserted into the posterior part of the base of the arytænoid cartilage. Its use is to open the rima glottidis a little, and, by pulling back the arytænoid cartilage, to stretch the ligament so as to make it tense.

CRI'CO-PHARYNGÆ'US, (from κρικος, *annular*, and φαρυγξ, *gutter*). It arises from the side of the thyroid cartilage, near the attachment of the sterno-hyoidæus, and thyreo-hyoidæus muscles; and from the cricoid cartilage, near the crico-thyroidæus. It is inserted into the white line, where it joins with its fellow, the superior fibres running obliquely upwards, covering nearly one-half of the middle constrictor, and terminating in a point: the inferior fibres run more transversely, and cover the beginning of the œsophagus. Its use is to compress that part of the pharynx which it covers, and to raise it, with the larynx, a little upwards.

CRI'CO-THYROIDÆI, (from κρικος, *a ring*, θυρεος, *a helmet*, and ειδος, *shape*). These muscles arise from the sides and forepart of the cricoid cartilage, running obliquely upwards: are inserted each by two portions, the first, into the lower part of the thyroid cartilage; the second into its inferior cornu. Their uses are, to pull forwards and depress the thyroid, or to elevate and draw backwards the cricoid, cartilage.

CRICOID CARTILAGES, (κρικοειδης; from κρικος, *a ring*, and ειδος, *resemblance*); the round ring-like cartilages of the larynx. See CARTILAGO.

CRINATED, (from *crinis*, a hair); in botany, a term applied to such *roots*, as shoot into the ground in many small fibres like hairs.

CRI'NIS; the hair growing on the back part of the head. See CAPILLUS.

CRINO'NIS, (from *crinis*, the hair), also called *Comedones*. These are collections of a sebaceous matter in the cutaneous follicles upon the face

and breast; appearing like black spots, and when pressed out, looking like small worms, or, as they are commonly called, maggots.

CRI'SIS, (κρισις; from κρινω, *to judge*); the sudden change of symptoms in acute febrile diseases, indicating recovery or death. See FEVER.

CRI'STA GA'LLI; an eminence of the ethmoid bone, so called from its resemblance to a cock's comb. See ETHMOIDES.

CRI'STÆ, a name for certain excrescences which grow about the anus and pudenda, particularly in venereal cases.

CRISTA'TUS, (from *crista*, a cock's comb); in botany, crested, having a tuft upon the top.

CRITICAL DAYS. Many physicians have been of opinion, that there is something in the nature of fevers which generally determines them to be of a certain duration; and, therefore, that their terminations, whether in health or in death, happen at certain periods of the disease rather than at others. These periods are called the *Critical Days*. They were carefully observed by Hippocrates and the ancients, but have been denied by many to take place in the fevers of these northern regions. Dr. Cullen, however, is of opinion, that the doctrine of the ancients, and particularly that of Hippocrates, on this subject, was well founded; and that it is just and true, even with respect to the fevers of our climate. For this opinion he gives the following reasons: 1. Because the animal economy is readily subjected to periodical movements, both from its own constitution, and from habits which are readily produced in it. 2. Because periodical movements take place in the diseases of the human body with great constancy and exactness, as in the case of intermittent fevers, and other diseases.

The *critical days*, or those on which the termination of continued fevers is supposed to happen, are, the *third*, *fifth*, *seventh*, *ninth*, *eleventh*, *fourteenth*, *seventeenth*, and *twentieth*. We mark none beyond this last; because though fevers are sometimes protracted beyond this period, the instances are but rare, and we have not a sufficient number of observations to ascertain the course of them: and likewise because it is probable, that in fevers long protracted, the movements become less exact and regular, and are therefore less easily observed. This appears from the facts laid down by Hippocrates: as, in 163 cases of fever, no fewer than 107, or more than two thirds of the whole number, terminated on one or other of the eight days abovementioned; none terminated on the second or thirteenth; and upon the eighth, tenth, twelfth, fifteenth, sixteenth, eighteenth, and nineteenth, there are but 18 terminations, or one-ninth of the whole. But though it must be acknowledged that it is the general tendency of the animal-economy to determine the periodical movements in fevers to be chiefly on critical days, it must also be acknowledged, that in many cases the regular course of it may be disturbed by particular circumstances. Thus, though the chief and more remarkable exacerbations in continued fevers happen on the critical days, there are truly exacerbations happening every day; and these, from certain causes, may become considerable and critical.

What determines the periods to be changed about the 11th day, has not been well understood. But the fact is certain: for there is no instance of any termination on the 13th; but on the 14th, 17th, and 20th, there are 43 instances of termination, and only six on all the intermediate days between these. Hippocrates indeed makes mention of many terminations happening on the 4th day; but, from its consistency with the general tendency, and some other considerations, Dr. Cullen is led to think that the terminations on this day are to be looked upon only as irregularities. The opinions of those modern physicians who refuse the prevalence of critical days, he thinks, are to be little regarded. The observation of the course of continued fevers is difficult and fallacious; and therefore the regulating of that course may have escaped inattentive and prejudiced observers. His own observations amount to this: That fevers with moderate symptoms, generally cases of the synocha, frequently terminate in nine days or sooner, and very constantly on one or other of the critical days which fall within that period: but it is very rare in this climate, that cases of either the typhus or synochus terminate before the 11th day; and when they do terminate on this day, it is most commonly fatal. When protracted beyond this period, their termination has been very constantly observed on the 14th, 17th, or 20th day.

In such cases, the salutary terminations are seldom attended with any considerable evacuation. A sweating frequently appears, but is seldom considerable; and critical and decisive terminations have been hardly ever observed attended with vomiting, evacuations by stool, or remarkable changes in the urine. The solution of the disease is chiefly to be discerned from some return of sleep and appetite, the ceasing of the delirium, and an abatement of the frequency of the pulse. By these symptoms we can often mark a crisis of the disease; but it seldom happens suddenly and entirely, and it is most commonly from some favourable symptoms on one critical day that we can announce a more entire solution on the next following.

CRI'THE, (κριθη), the disease commonly called the *stye*, is a sort of tubercle that grows on the eyelids. When small, it is seated on the edge of the eyelid; but when large, it spreads further. When these do not suppurate, they remain in a thickened and indurated state. If there is little inflammation, they may be dispersed by cooling lotions: but if those do not succeed, we should endeavour to sup-

purate them with a white-bread poultice, and the use of a little camphorated oil applied with a camel's hair pencil.

CRITHMUM, SAMPHIRE; a genus in Linnæus's botany. There are three species. It grows wild on rocks, and in maritime places; the leaves resemble those of fennel, but the segments are thicker and shorter: to the taste they are warm and bitter, to the smell somewhat like smallage. They are reckoned aperient and diuretic; but their chief use is as a pickle.

CRO'CUS, (κροκος of Theophrastus); SAFFRON. The prepared stigmata of the *Crocus sativus*, Linn. *Crocus spatha univalvi radicali, corolli tubo longissimo.* Class, *Triandria.* Order, *Monogynia.* Saffron is a very elegant and popular aromatic: besides the virtues assigned it in common with all the bodies of that class, it is said remarkably to exhilarate, and raise the spirits. Indeed, formerly, it was accounted one of the highest cordials; and, when taken in large doses, said to occasion immoderate involuntary laughter, and all the ill effects which follow from the abuse of spirituous liquors. But notwithstanding the great power attributed to this medicine by many writers, it appears, from the experiments carefully made by modern practitioners, that it has no properties of any consequence. Dr. Cullen says, in two instances he thought it manifested some power as an emmenagogue: but though tried in many other cases in large doses, it disappointed his expectations. In several hysterical cases it has been given to the extent of half an ounce a day, without producing any sensible effect; so that now it has almost fallen into disuse except as a colouring ingredient. The Edinburgh College directs a tincture, and that of London a syrup, of this drug; and it also enters many other officinal compositions to very little purpose.

CRO'CUS, a term given, by the older chemists, to several preparations of metallic substances, from their resemblance to saffron in colour: thus, *crocus martis*, *crocus veneris*, &c. are terms used in their writings.

CRO'CUS ANTIMO'NII, formerly called *Crocus metallorum.* This preparation is a sulphurated oxyd of antimony, and therefore called *stibium sulphuratum* in the new chemical nomenclature. It possesses emetic and highly cathartic powers, producing, in most cases, a violent diaphoresis afterwards. See OXYDUM STIBII SULPHURATUM.

CRO'CUS SATI'VUS; the systematic name for the officinal saffron. See CROCUS.

CRO'TALUS, the rattle-snake. See RATTLE-SNAKE.

CRO'TAPHITE MUSCLE, *(crotaphites*, κροταφιτης; from κροταφος, *the temple)*, a name for the temporal muscle. See TEMPORALIS.

CROTOLA'RIA, a genus in Linnæus's botany. There are twenty-three species.

CRO'TON CASCARI'LLÆ; the plant which affords the cascarilla bark. See CASCARILLA.

CRO'TON LACCI'FERUM; the systematic name of the plant upon which gum-lac is deposited. See LAC.

CRO'TON TIG'LIUM; the tree which affords the pavana wood and tiglii seeds. See LIGNUM PAVANÆ, and TIGLIA GRANA.

CRO'TON TINCTO'RIUM; the systematic name of the lacmus plant. See BEZETTA CÆRULEA.

CROUP, an inflammation of the membrane which lines the trachea. See CYNANCHE.

CROUTE, or SOUR CROUT. See SAUER KRAUT.

CROW-FOOT. See CANUNCULUS.

CROW-FOOT CRANESBILL. See GERANIUM BATRACHIOIDES.

CRUCIAL LIGAMENTS. These rise from the inside of each condyle, and are attached to the femur. They give strength to the knee joint and limit its motion.

CRUCIANE'LLA, PETTY MADDER; a genus in Linnæus's botany. There are six species.

CRUCIA'TA, (from *crux*, a cross, so called because its leaves are disposed in that form); a species of VALANTIA, which is called cross-wort, or mug-weed. There is also a species of gentian which is thus named.

CRUCIBLE, (from *crucio*, to torment; because, in the language of the old chemists, metals were *tormented* in it, to make them yield up their virtues); a chemical vessel, mostly made of clay and sand; but sometimes of black-lead, forged iron, or platina. It is used for roasting, calcination, and fusion. See CHEMISTRY and CHEMICAL APPARATUS. Chaptal says, crucibles ought to support the strongest heat without melting, and be capable of resisting the attacks of all such agents as are exposed to heat in vessels of this kind. Those crucibles which possess the greatest degree of perfection are made in Hesse, or Holland. Those made of platina, unite the most excellent properties. They are nearly infusible, and at the same time indestructible by fire. M. Achard, and M. Morveau, have made them by first fusing platina with arsenic: at first indeed it remains brittle; but, in proportion as the arsenic is driven off by the continuance of heat, it becomes more ductile. These chemists, by melting it a second time in moulds, formed crucibles. Various other materials, and modes of combining them, have been practised.

CRUCIFORM, in botany, a term applied to a flower that consists of four petals, regularly disposed in form of a cross: they constitute the fifth class in Tournefort, and the tetradynamia of Linnæus.

CRU'CITA, a genus in Linnæus's botany. There is but one species.

CRUDITY, signifies properly rawness, or any thing not duly digested and mixed, whether in ani-

mal or other substances. Thus we speak of crudities in the stomach, primæ viæ, &c. The term is also applied to some drugs in their unrefined state, as crude sal ammoniac, crude quicksilver, &c.

CRU'OR, a term which sometimes means the blood in general, and sometimes the venal blood only. This, however, is the proper term for the thick, red part of the blood, called also *crassamentum*, in distinction to the serous or aqueous part. See BLOOD.

CRUPI'NA, purplish flowering Narbonne centaury; a species of CENTAUREA.

CRU'RA, (the plural of *crus*, a leg or root); a term applied to some parts of the body, from their resemblance to a leg or root: thus, we have *crura cerebri*, *crura cerebelli*, the *crura* of the diaphragm, &c.

CRURÆ'US, another name for the cruralis muscle. See CRURALIS.

CRURA'LES ARTERIÆ, the crural arteries. The external iliac arteries pass out of the belly under the inguinal glands, and there take the name of *crural*. Each runs under the sartorius, vastus internus, and triceps muscles, and is covered by them to the lower part of the thigh; a little above the internal condyle of the os femoris, it runs to the ham, and there takes the name of *popliteal*.

CRURA'LIS, (from *crus*, the leg); a muscle which arises fleshy, from between the two trochanters of the os femoris, but nearer the minor, firmly adhering to most of the fore-part of the os femoris, is connected to both vasti muscles. It is inserted tendinous into the upper part of the patella, behind the rectus. The use is to assist in the extension of the leg.

CRURA'LIS. The nerve which passes from the loins into the thigh, is thus called. It is produced by the conjunction of the second, third, and fourth lumbar branches. It passes under Poupart's ligament, runs on the fore-part of the thigh, upon the iliacus internus muscle, and one of its principal branches accompanies the vena saphena to the ankle.

CRURAL HERNIA, or femoral hernia; a tumor under the groin, and in the upper part of the thigh, arising from a protrusion of part of an intestine under Poupart's ligament. See HERNIA CRURALIS.

CRUS, the leg. According to some anatomists, it includes the whole of the lower extremity, from the os innominatum to the toes; viz. the thigh, leg, and foot. It sometimes signifies only the thigh: by some it is confined to that part between the knee and ankle. The epithet *femoral*, however, has been more recently applied to parts situated in the thigh.

CRUS GALLI, COCK'S-SPUR, or Virginian pear-leaved *Azarole*, or thorn; a species of CRATÆGUS.

CRU'STA LA'CTEA, the *milk-scab*; a disease that mostly attacks some part of the face in infants at the breast. It is known by an eruption of broad pustules, full of a glutinous liquor, which form milk-white scabs when they are ruptured.

Dr. Willan, in his description of different kinds of pustules, defines this to be a pustule of intermediate size between the *phlyzacium* and *psydacium*, which contains a straw-coloured fluid, having the appearance, and nearly the consistence, of strained honey. It appears most frequently about the head, and is succeeded by a dull white or yellowish scab. Pustules of this kind, when so large as nearly to equal the size of phlyzacia, are termed *ceria*, or *favi*, being succeeded by a yellow, semi-transparent, and, sometimes, cellular scab, like a honey-comb.

This disease is treated by that judicious writer, under the generic name of ACHOR. It differs from those named *favus* and *tinea* only in the degree of virulence. *Favus* is when the perforations are large; and *tinea* when they are like those which are made by moths in cloth: but generally, by tinea, is understood a dry scab on the hairy scalp of children, with thick scales, and an offensive smell. See TINEA. It is only when this disorder affects the face, that it is called *crusta lactea*. In his Treatise on Ulcers, Mr. Bell says, that both may be reduced under the head of *herpes pustulosus*; they being naturally the same, and differing only in situation. Dr. Cullen places this disease under ULCUS; as a synonyme; where also he places the *crusta lactea*, in the class *locales*, and order *dialyses*.

The treatment proper for these cruptions is, purging with calomel, antimonials in small doses, and cinchona, internally; as topical remedies, ung. hydrarg. nitrat. solutions of muriated mercury, &c.

CRUSTA'CEA, (from *crusta*, a shell); animals which have the external parts firm and hard, but contain a fleshy soft substance within; or which, being covered with slender crusts or shells, are destitute of bones internally. Linnæus classes them among the insects without wings, under the generical name of CRABS. Dr. Cullen takes notice in general of the lobster, crab, prawn, and shrimp only, of which he says the two former hardly differ in any quality from one another: and from the small proportion of volatile alkali that is obtained from their entire substance, or extract, he concludes they contain less of animal substance than the flesh of quadrupeds, birds, or even the amphibia. With respect to them as aliment, they are much of the nature of most fishes; approaching to the nature of many, in being without oil, or having it in a very small proportion, and therefore affording less nourishment. They appear to be more difficult of digestion than most fishes. See FISH.

CRY'PTÆ, (κρυπται; from κρυπτω, *to hide*); a term used by anatomists to denote those little rounded appearances, at the end of the small arteries of the cortical substance of the kidneys, that

appear as if the artery were convoluted upon itself.

CRIPTA'NTHERÆ, (from κρυπτω, *occulto*, to hide, and ανθος, *flos*, a flower), in botany, the nineteenth class in Royen's system, comprehending those plants whose fructification is concealed, viz. part of the *Filices*, *Musci*, *Algæ*, and *Fungi*.

CRYPTOGA'MIA, (from κρυπτὸς, *occultus*, concealed, and γαμος, *nuptiæ*, nuptials), in the Linnæan system of botany, a class of plants, the twenty-fourth, or last in order. This class consists of such plants as either bear their flowers concealed within the fruit, or, have them so small as to be imperceptible; it includes four orders, viz. *Filices*, ferns, *Musci*, mosses, *Algæ*, flags, and *Fungi*, mushrooms, consisting each of a variety of genera.

CRYPTOME'TALLINES. These are fossil bodies, which have no appearance of metals, yet contain them in such a quantity, that they may be called metallic bodies, or ores of metals. They form a class of fossils.

CRYSTALLINE LENS, or CRYSTALLINE HUMOUR; the second humour of the eye, that lies immediately next to the aqueous, behind the uvea, opposite to the pupil, nearer to the fore-part than the back-part of the globe. It is the least of the humours, but much more solid than any of them. Its figure, which is convex on both sides, resembles two unequal segments of spheres, of which the most convex is on its back-side, which makes a small cavity in the vitreous humour in which it lies. It is contained in a fine capsule called *Aranea*. See EYE.

CRYSTALLIZATION, (*crystallizatio*, from *crystallus*, a crystal); a property by which crystallizable bodies tend to assume a regular form, when placed in circumstances favorable to that particular disposition of their particles. These either remain at a distance from each other, by virtue of their attraction to the solvent, or they come together by their own mutual attraction, and form consistent crystals. See ATTRACTION.

From various facts there appears to be just ground to conclude, that the particles of bodies demand certain relative positions and distances, in order that the energy of their attraction may be the greatest possible; in a manner similar to what we observe in the attractions of magnetism and electricity. This polarity of the particles deducible by mathematical reasoning from their supposed figures, but no doubt in a great measure dependent on their component parts likewise, will cause the aggregate masses to assume some determinate figure, in similar circumstances or situations, and this figure will be modified in a great variety of ways, according as those circumstances are changed. If the particles are suspended or kept fluid, either by a due quantity of solvent, or by heat, or by both of these agents, a separation will ensue, whenever the quantity of the solvent or of the heat is diminished. If this diminution be sudden, it will be attended with a considerable share of intestine motion, by which the particles must be irregularly moved, and will eventually come together with such sides or faces presented to each other, as might not have been presented if the irregularity of motion had not interfered. In such cases the particles will form a solid, possessing little or no symmetry in its figure. This is called confused crystallization.

On the other hand, it may happen, that by gradual evaporation, or cooling, the diminution of the quantities of solvent, or of heat, may take place so slowly as to occasion a degree of motion altogether inconsiderable among the parts of the fluid. In this case, the particles which are about to separate will approach each other with extreme slowness, and no circumstance will interfere to prevent their applying such sides or faces towards each other as are best adapted to the governing laws of attraction. As soon as the particles have arrived to a distance less than is sufficient for their mutual attraction to overcome the power of the fluid which suspends them, they will rush together, and form symmetrical bodies possessing figures originating in, and dependent on, the properties or nature of the particles which form them, and the symmetry will be more perfect the less the crystallization is influenced by disturbing causes. This is called regular crystallization, and the symmetrical bodies are called crystals.

As the agitation, arising from the causes just mentioned, is sufficient to prevent the regular formation of crystals, so likewise it is found, that mechanical agitation is still more destructive of their regularity. Slow crystallization produces sugar-candy; a quicker crystallization affords loaf-sugar. When a balloon, some years ago, was inflated in Moorfields, by inflammable air, extricated by the action of vitriolic acid upon zinc, the white vitriol of commerce was afforded in beautiful transparent crystals, which the shops refused to purchase; but when, by subsequent solution and mechanical agitation, a white mass of confused crystals was obtained, the shop-keepers recognized the *white vitriol* they had been used to deal in. The presence or absence of external impulse is of so much consequence in crystallization, that it may be doubted whether the action of light, which considerably impedes the formation of regular crystals, may not be attributed to this cause.

The permanent texture of bodies, their fracture, and other like circumstances, appear to depend upon the state of crystallization at the time of assuming the solid form. In metals, for example, the crystals are smaller and more confused the hastier the cooling. Thus steel, suddenly cooled, breaks with a granular fracture, possesses a diminished specific gravity, and is very hard; whereas

the same steel, more slowly cooled, will be denser, softer, difficult to be broken asunder, and when broken exhibits a very different internal texture. The crystals of other metals may be obtained by fusing them in a crucible with a hole in its bottom closed by a stopper, which is to be drawn out after the vessel has been removed from the fire, and the surface of the metal has begun to congeal. The same effect may be observed if the metal be poured into a plate or dish, a little inclined, which is to be suddenly inclined in the opposite direction, as soon as the metal begins to congeal round its edges. In the first method, the fluid part of the metal runs out of the hole, leaving a kind of cup lined with crystals; in the latter way the superior part, which is fluid, runs off, and leaves a plate of metal studded over with crystals.

There is scarcely any experiment in chemistry which does not afford some appearance of a curious nature, referable to crystallization. When bodies dissolved in any fluid are separated by crystallization, they are always found to retain a part of the fluid. The water thus retained by saline crystals is called the water of crystallization. This water appears to be essential to the transparent crystalline form of salts, and is no doubt retained by virtue of their attraction for that fluid. From some experiments, in which a much greater degree of cooling was produced by the solution of crystallized soda, than of such as had lost its water of crystallization, it may be inferred, that this water exists in crystals in the congealed or solid state, and perhaps much denser than mere ice. Most salts may be deprived of their water of crystallization by mere heat. Some lose it in the common temperature of the atmosphere, and fall into a pulverulent mass, called an efflorescence. Other salts attract water so strongly that they draw it from the atmosphere, and gradually become fluid, a phenomenon distinguished by the name of deliquescence. Mr. Baumé affirms, that the water of crystallization, in all neutral salts with bases of fixed alkali, is pure, and they are not capable of taking up a redundancy of either principle in their crystals. This however may be doubted.

The crystallization of salts is usually effected by evaporating part of the water; but it may likewise be made to take place by abstraction of the water in the way of chemical affinity. Thus if strong rectified spirit be added to an equal volume of a strong solution of nitre, the spirit combines with the water, and almost the whole of the nitre separates in an instant in the crystalline form. There is no doubt but appearances of this kind of separation have misled chemists on various occasions.

CRYSTALS, salts or other substances, shot or congealed in the manner of crystal. Thus we have the crystals of tartar, of soda, &c.

CTESIAS, a native of Cnidos, who accompanied Cyrus the son of Darius in his expedition against his brother Artaxerxes; by whom he was taken prisoner. But curing Artaxerxes of a wound he received in the battle, he became a great favourite at the court of Persia, where he continued practising physic for 17 years, and was employed in several negociations. All we have remaining of his numerous writings, is an abridgment compiled by Photius.

CUBE, a solid body of six equal sides, which are all squares. It is one of the five regular bodies, and its contents are found by multiplying any one side or surface by the height.

CU'BEBÆ, (from *cubabah*, Arab.), CUBEBS; the dried berries of the *Piper cubeba; foliis obliquo-ovatis, seu oblongis venosis acutis, spica solitaria pedunculata oppositifolio, fructibus pedicellatis*, Linn. They are of an ash-brown colour, generally wrinkled, and resembling pepper, but furnished each with a slender stalk. They are a warm spice, of a pleasant smell, and moderately pungent taste, imported from Java. They may be exhibited in all cases where warm spicy medicines are indicated, but they are inferior to pepper.

CUBEBS. See CUBEBÆ.

CUBIT, (from *cubo*, to lie down; because the ancients used to rest, in a recumbent position, on this part, when at their meals); the fore-arm, or that part between the bend of the arm, including the elbow and wrist.

CUBITA'LIS, a name of the ulnar nerve. Mr. Cheselden describes the cubital nerves as being two in each arm, the upper part passing over the upper extuberance of the os humeri, and running on to the thumb and the three next fingers by its branches, which spread when it approaches the thumb: the inferior, which passes under the inner extuberance of the os humeri, proceeds on to the ring and little fingers.

CUBITA'LIS ARTERIA, the cubital or ulnar artery. It parts from the radial artery about a finger's breadth below the bend of the arm. Near the carpus it lies just under the integuments, runs across the palm of the hand, and forms an arch, which anastomoses with that of the radial; whence these arteries go to each finger and to the thumb.

CU'BITUS, a cubit measure. In botany, it is eighteen inches; so the stalks of plants are named *cubitalis, bicubitalis*, &c. according to their height.

CUBOI'DES OS, (κυβοειδης; from κυβος, *a cube or die*, and ειδος, *likeness*); a tarsal bone of the foot, so called from its resemblance to a die. Behind, it is formed into an oblong unequal concavity, adapted to the fore-part of the os calcis. On its internal side, there is a small semicircular smooth cavity, to join the navicular bone; immediately before which, an oblong smooth plane is made by the os cuneiforme externum. Below this the bone is hollow and rough. On the internal side of the lower surface a round protuberance and fossa are

found, where the *musculus adductor pollicis* has its origin. On the external side of this same surface, there is a round knob, covered with cartilage; immediately before which a smooth fossa may be observed, in which the tendon of the *peroneus primus* runs obliquely across the foot; and on the knob the thin flat cartilage proper to this muscle plays; in place of which sometimes a bone is found: more externally than the knob, a rough hollow is made, for the strong ligaments stretched between this bone and the os calcis. Anteriorly, the surface of the os cuboides is flat, smooth, and slightly divided into two planes, for sustaining the os metatarsi of the little toe, and of the toe next to it. The form of the back-part of the os cuboides, and the ligaments connecting the joint with the os calcis, both concur in allowing little motion in this part.

CUCKOW FLOWER. See CARDAMINE.

CUCULLA'RIS, (from *cucullus*, a hood; so named, because it is shaped like a hood); the muscle otherwise named *trapezius*. See TRAPEZIUS.

CU'CUMIS, *(quasi curvimeres*, from their curvature); the CUCUMBER. This fruit is the produce of the *Cucumis sativus: foliorum angulis rectis; pomis oblongis scabris*, Linn. Dr. Cullen says, the cucumber, as commonly employed in its unripe state, is perhaps in that condition not very nutrient; but it is so much so as to make a considerable part of the aliment of many persons in warm climates and seasons: and its aqueous, cooling, and accescent qualities, render it a very proper summer aliment. The firmness, however, of its texture, occasions it often to be too long retained in the stomach; whence it frequently occasions acidity and flatulency, and is therefore properly accompanied with some of the condimenta, as pepper, salt, vinegar, &c.

CU'CUMIS AGRE'STIS, wild or squirting cucumber; the *cucumis asininus; Momordica elaterium*; *pomis hispidus cirrhis nullis*, Linn. Class, *Monœcia*. Order, *Syngenesia*. The dried juice of this plant, is the ELATERIUM of the shops. It has neither smell nor taste, yet it is the most powerful cathartic in the whole materia medica. Its efficacy in dropsies is said to be considerable; but it requires great caution in the exhibition. Dr. Cullen is very shy of this remedy. Small doses are usually given at first, and repeated at proper intervals.

CU'CUMIS ASINI'NUS. See CUCUMIS AGRESTIS.

CU'CUMIS COLOCY'NTHIS; the systematic name of the officinal bitter-apple. See COLOCYNTHIS.

CU'CUMIS MELO; the systematic name of the melon plant. See MELO.

CU'CUMIS SATI'VUS; the systematic name of the common cucumber plant. See CUCUMIS.

CUCU'RBIT, (from *cucurbita*, a gourd, as resembling it in shape); the name of a chemical vessel employed in distillation, when covered with its head. Some cucurbits, however, are shallow and wide-mouthed. They are made of copper, tin, glass, and stone ware, according to the nature of the substances to be distilled. A cucurbit, provided with its capital, constitutes the vessel for distillation called an ALEMBIC.

CUCU'RBITA, *(a curvitate*, according to Scaliger; the first syllable being doubled, as in *cucula*, *populus*, &c.) the common pumpion. The seeds of this plant, *Cucurbita pepo; foliis lobatis, pomis lævibus*, are used instead of those of the *Cucurbita lagenaria; foliis subangulatis, tomentosis, basi subtus biglandulosis; pomis lignosis*, Linn. or gourd. They contain a large proportion of oil, which may be made into emulsions; but that of sweet almonds is preferable.

CUCU'RBITA CITRU'LLUS; the systematic name of the water-melon plant. See CITRULLUS.

CUCU'RBITA LAGENA'RIA; the systematic name for the bottle-gourd plant. See CUCURBITA.

CUCU'RBITA PEPO; the systematic name of the common pumpion. See CUCURBITA.

CUCURBITA'CEÆ, the name of the 34th order in Linnæus's fragments of a natural method, consisting of plants which resemble the gourd in external figure, habit, virtues, and sensible qualities. This order contains the following genera, viz. gronovia, melothria, passiflora, anguria, bryonia, cucumis, cucurbita, fevillea, momordica, sicyos, trichosanthes.

CUCURUCU, a serpent found in America, growing ten or twelve feet long. It is a very poisonous species, and greatly dreaded by the natives; but its flesh is a very rich food, and much esteemed among them, when properly prepared.

CU'LEX, the GNAT; an insect, well known and troublesome enough in this country, but by no means so severe in its bite as the musketo fly *(culex pipiens)* in hot climates. In the day time, or at night, these last come into the houses; and when the people are gone to bed, they begin their disagreeable humming, approach always nearer to the bed, and at last suck up so much blood that they can hardly fly away. The bite causes blisters in people of a delicate constitution. When the weather has been cool for some days, the musketoes disappear; but when it changes again, and especially after rain, they gather frequently in astonishing quantities about the houses. In sultry evenings they accompany the cattle in great swarms, from the woods to the houses or to town; and when they are driven before the houses, the gnats fly in wherever they can. In the greatest heat of summer, they are so numerous in some places, that the air seems to be quite full of them, especially near swamps and stagnant waters. The inhabitants therefore make fires before their houses to expel

these disagreeable guests by the smoke. The common remedies for their stings are vinegar, olive oil, and camphorated spirits.

CULI'LAWAN; also called *Culitlawan*, and *Cortex caryophylloides;* the bark of the *Laurus culilawan; foliis triplinerviis oppositis*, Linn. It very much resembles cinnamon in appearance and properties, but is little used in this country.

CULINARY, (from *culina*, a kitchen); any thing belonging to the kitchen, as culinary salt, culinary herbs, &c.

CU'LMUS, (from καλαμος, *a reed*, or from *kalam*, Arab.); in botany, the *stalk* or *blade* of corn or grass. Culmiferous plants have a smooth jointed stalk, are usually hollow, and at each joint wrapped about with single, narrow, sharp-pointed leaves; and their seeds are in chaffy husks, as wheat, barley, &c. In grasses and corns, the culmus corresponds to the caudex or trunk of trees; so that it generally denotes that part between the root and the ear, or panicle. Botanists differ in their distribution of plants into culmiferous.

CULMI'NIÆ, (from *culmen*, the top); in botany, the twenty-fifth order in Linnæus's fragments of a natural method.

CULMIFEROUS, (from *culmus*, a straw or haulm); an epithet applied to plants which have a smooth jointed stalk, usually hollow, and wrapped about at each joint with single, narrow, sharp-pointed leaves, and the seeds contained in chaffy husks; such as oats, wheat, barley, rye, and the other plants of the natural family of the grasses.

CUMIN SEEDS. See CUMINUM.

CU'MINUM (κυμινον; from κυω, *to bring forth;* because it was said to cure sterility), or *Cyminum;* CUMIN. It is the *Cuminum cyminum*, Linn. Class, *Heptandria.* Order, *Digynia.* The seeds of this plant, which are the only part used in medicine, have a bitterish taste, accompanied with an aromatic, flavour, but not agreeable. They are, generally, preferred to other seeds, for external use, in discussing indolent tumors, as the encysted, scrophulous, &c. and give name both to a plaster and cataplasm in the pharmacopœias.

Emplastrum Cumini. Lond.

Take of Cumin seeds,
Caraway seeds,
Bay berries, of each three ounces;
Burgundy pitch, three pounds;
Yellow wax, three ounces.

Melt the pitch and wax together, and mix with them the rest of the ingredients, powdered, and make a plaster.

Cataplasma Cumini. Lond.

Take of Cumin seeds, one pound;
Bay berries,
Dry leaves of water-germander, or scordium,
Virginian snake root, of each three ounces;
Cloves, one ounce.

Rub them all together to powder; and, with the addition of three times their weight of honey, make a cataplasm.

CU'MINUM CY'MINUM; the systematic name of the cumin plant. See CUMINUM.

CUNEIFO'RME OS, (from *cuneus*, a wedge); a name of the os sphenoides, from its being *wedged* between the other bones. It is also a name for the third of the first row of bones in the wrist; so called from its appearing like a wedge, sticking between the two rows.

CUNEIFO'RMIA OSSA, are the fourth, fifth, and sixth bones of the foot, thus called from their wedge-like shape; from *cuneus*, a wedge, and *forma*, shape; for they are large above, and narrow below. They lie all three at the side of each other. The upper side is convex, and the under, hollow; by which means the muscles and tendons in the bottom of the foot are not hurt in walking. At one end these bones have each a sinus, which receives the os naviculare; and at the other end they are joined to the three inner bones of the metatarsus. The innermost of these bones is the largest, and that in the middle the least.

CUNI'LA, a genus in Linnæus's botany. He enumerates four species.

CUNO'NIA, a genus in Linnæus's botany. There is but one species.

CU'PEL, in chemistry, a small vessel which absorbs metallic bodies, when changed by fire into a fluid scoria; but retains them as long as they continue in their metallic state. One of the most proper materials for making a vessel of this kind is the ashes of animal bones; there is scarcely any other substance which so strongly resists vehement fire, which so readily imbibes metallic scoriæ, and which is so little disposed to be vitrified by them. For want of these, some make use of vegetable ashes, freed, by boiling in water, from their saline matter, which would cause them to melt in the fire.

CUPELLATION, (from *kuppel*, Germ.); the purifying of perfect metals, by the extraction of such imperfect metals as are intermixed with them. This is performed by the addition of a certain quantity of lead to the mixture, and the exposing of it to a due heat; which vitrifies the lead, and, together with it, the imperfect metals of the original mixture, leaving the perfect in a pure and separate state. This operation derives its name from the vessels used in it. These are a kind of flat crucibles, pretty like the small cups known under the name of *cupels:* and the substance of which they are composed, being the earth of bones, is sufficiently porous to absorb and retain the lead that is scorified by the heat.

CUPRE'SSUS, (κυπρεσσος, or κυπαρισσος; so called, απο τȢ κυειν παρισȢς τȢς ακρεμονας, *because it produces equal branches);* the *Cupressus sempervirens; foliis imbricatis squamis quadrangulis*, Linn.

Every part of this plant was formerly used medicinally. It abounds with a bitter, aromatic, terebinthinate juice, and is said to be a remedy against intermittents; but modern practice has rejected it.

CU'PRUM, (*quasi æs Cyprum*; so called from the island of Cyprus, whence it was brought); copper. See COPPER. The officinal preparations of the oxyd of this metal are: *Ærugo præp.* Lond. *Oxymel Æruginis*, Lond. *Ung. subacet. cupr.* Edin. It also enters the *Emp. melo. vesic.* Edin. and is employed in the production of *acid. acetos.* Lond. See the articles ÆRUGO, OXYMEL, and ACETOUS ACID.

CU'PRUM AMMONIACA'LE. See SULPHAS CUPRI AMMONIACALIS.

CU'PRUM VITRIOLA'TUM. See SULPHAS CUPRI.

CU'RA AVENA'CEA. A decoction of oats and succory roots, in which a little nitre and sugar were dissolved, was formerly used in fevers, and was thus named.

CU'RCAS, a name given, in Egypt, to an esculent root, approaching to the taste and virtues of the colocasia. It is also a name used in Malabar for a small fruit of the shape and size of an hazelnut. Both these drugs have the credit of being strong provocatives; and it is very probable, that the curcas of the East Indies may be the fruit called BEL by Avicenna, and said to possess the same virtues. Garcias has been led into a very great error by this similarity of names and virtues; and supposes the curcas of Egypt the same with that of the East Indies.

CURCU'MA, (from the Arabic *curcum*, or *hercum*), *Curcuma longa*, or *Curcuma rotunda*; TURMERIC. It is the *curcuma longa; foliis lanceolatis; nervis lateralibus numerosissimis*, Linn. The root of this plant is imported, in its dried state, from the East Indies, in various forms. Externally it is of a pale yellow colour, wrinkled, solid, ponderous, and the inner substance of a deep saffron or gold colour: its odour is somewhat fragrant; to the taste it is bitterish, slightly acrid, exciting a moderate degree of warmth in the mouth, and on being chewed it tinges the saliva yellow. It is an ingredient in the composition of *curry powder*, is valuable as a dyeing drug, and furnishes a chemical test of the presence of uncombined alkalies. It is now very seldom used medicinally, but retains a place in our pharmacopœias, as a remedy in jaundice, dropsy, &c.

CURCU'MA LO'NGA; the turmeric plant. See CURCUMA.

CURCU'MA ROTU'NDA. See CURCUMA.

CURD, the substance produced by the coagulating or fixing of any fluid body, particularly milk. See the articles MILK and CHEESE. At Florence, they curdle milk, for the making of cheese, with artichoke flowers, in lieu of the rennet used for the same purpose with us. The Bisaltæ, a people of Macedonia, Rochfort observes, lived *wholly* upon curdled milk, *i. e.* on curds. He adds, that curds are the whole food of the people of Upper Auvergne in France, and whey their only drink.

CURING, a term used for the preserving fish, flesh, and other animal substances, by means of certain additions of things, to prevent putrefaction. One great method of doing this, is by smoking the bodies with the smoke of wood, or rubbing them with common salt, nitre, &c. See CONDIMENTA.

CU'RMI, a name given by the ancients to a sort of malt liquor or ale. It was made of barley, and was drunk by the people of many nations instead of wine, according to Dioscorides's account. He accuses it of causing pains in the head, generating bad juices, and disordering the nervous system. He also says, that in the western part of Iberia, and in Britain, such a sort of liquor was in his time prepared from wheat instead of barley.

CURRANTS. See RIBES.

CURSU'TA; a root so called in a former edition of the Edinburgh Pharmacopœia. It is the *Gentiana purpurea*, Linn. It is a strong bitter, has very much the appearance and taste of gentian; and in no degree superior, though by some it is used in *dyspepsia*. Dr. Home, in his list of the Materia Medica, styles it *Gentiana lutea sylvestris*; while he terms the common gentian, *Gentiana lutea sativa*. No botanic author, however, makes this distinction; nor can the name of *cursuta* be met with in any writer on the Materia Medica.

CU'SCUTA, (according to Linnæus, a corruption from the Greek Κασυλας, or Κασυλας, which is from the Arabic *chessuth*, or *chasuth*); DODDER. See EPITHYMUM.

CUSPIDA'TI, (from *cuspis*, a point; because they are pointed). See TEETH.

CUSPIDA'TUS, in botany, cuspidated; that is, when the leaves of a flower end in a point.

CUSSO'NIA, a genus in Linnæus's botany. He enumerates two species.

CUTANEOUS, (from *cutis*, the skin); belonging to the skin, as cutaneous eruptions, &c.

CU'TCH, a name by which the English in the East Indies call the *gum kino*.

CUTI'CULA, (dim. of *cutis*, the skin), the scarf-skin, or epidermis; a thin, pellucid, insensible membrane, of a white colour, that covers and defends the true skin. See EPIDERMIS.

CU'TIS, the true skin; a thick, fibrous, vascular, and nervous covering extended over the whole surface of the body. It is the situation of the organ of touch, exhalation, and inhalation, &c. See SKIN.

CU'TIS ANSERI'NA, (*anserina*; from *anser*, a goose). The rough state the skin is sometimes thrown into, from the action of cold or terror, in which it looks like the skin of a goose, has given occasion to this epithet.

CY'ANUS, (κυανος, *cærulean*, or *sky-blue;* so called from its colour); the blue-bottle, or CORN-FLOWER. This plant is the *centaurea cyanus; calycibus serratis; foliis linearibus, integerrimis, infimis dentatis*, Linn. The flowers were formerly in frequent use; but their antiphlogistic, anti-spasmodic, cordial, aperient, diuretic, and other supposed properties, are now, with great propriety, mistrusted.

CYATHIFO'RMIS, (from *cyathus*, a cup, and *forma*, likeness), in botany, shaped like a cup; that is, partly cylindrical, but expanding towards the top.

CY'ATHUS, (κυαθος, *a cup*, from the verb κυω, *to pour out*); a common measure among the Greeks and Romans, both of the liquid and dry kind. It was equal to one ounce, or the twelfth part of a pint. Their cyathus was made with a handle like our punch-ladle. Physicians still employ this term in prescription; and it usually denotes a wine-glass or tea-cupful of the medicine ordered.

CY'CAS, the SAGO-TREE; a genus in Linnæus's botany. He describes only one species, the CIRCINALIS. See SAGO.

CY'CLAMEN, (κυκλαμεν; from κυκλας, *circular;* either on account of the round form of the leaves, or of the roots), the plant called SOW-BREAD. See ARTHANITA.

CY'CLAMEN EURO'PEUM; the systematic name of the sow-bread. See ARTHANITA.

CYCLI'SCUS, (κυκλισκος, from κυκλος, *a circle*); an instrument in the shape of a half moon, formerly used for scraping a carious bone.

CYDER, or CIDER, a vinous liquor made from the juice of Apples. Dr. Cullen says it possesses the general properties of other wines. See WINE. In the cyder countries, and especially in America, they make what is called *Cyder-Wine*, by boiling the apple juice to one half the quantity, before it is fermented. An ardent spirit is also procured from Cyder by distillation. Cyder is liable to a dangerous impregnation from lead. See PICTONUM COLICA.

CYDERKIN, called also, PURRE, or PERKIN, a liquor made by infusing in water, the murk, or gross matter, remaining after the cyder is pressed out. After 48 hours maceration, what is squeezed out by the press is immediately tunned up and stopped; and is fit to drink in a few days. It clarifies of itself, and serves families instead of small beer; keeping longer if a convenient quantity of hops be added.

CYDO'NIUM MA'LUM, (from *Cydon*, a town in Crete, where they grew), the QUINCE; *Pyrus cydonia*, Linn. *Pyrus foliis integerrimis, floribus solitariis.* Class, *Icosandria.* Order, *Pentagynia.* The seeds are directed by the London College to be made into a mucilage, which is recommended in aphthous affections and excoriations of the mouth and fauces. See MUCILAGE.

CYLINDER, a solid body made by the rotation of a rectangular parallelogram about one of its sides; so that when, in anatomy, a vessel is said to be cylindrical, it is meant that it is so shaped, as not to be narrower at one end than another, but that it is of the same diameter in all places, contrary to a *cone*, or a *conical vessel.* See CONE.

CY'MA, (κυμα, *a fœtus*; from κυω, *to bring forth)*, in botany, a CYME. It properly signifies a sprout or tender shoot, particularly of the cabbage. Linnæus explains it to be an aggregate flower, composed of several florets, sitting on a receptacle, producing all the primary peduncles from the same point, but having the partial peduncles scattered or irregular; all fastigiate, or forming a flat surface at top. The *cyme*, is either naked or with bractes. Flowers disposed in a cyme are called cymose flowers: hence Cymosæ, the sixty-third of Linnæus's natural orders in the Philosophia Botanica.

CYMBALA'RIA, a species of SAXIFRAGA. Also the ivy-leaved toad-flax, a species of ANTIRRHINUM.

CY'MIA, an ancient vessel in the shape of a urinal.

CYNA'NCHE, a name for the quinsy, or inflammation of the fauces, tonsils. &c. Cullen distinguishes five species of Cynanche, viz. 1. *Cynanche tonsillaris.* 2. *Cynanche maligna.* 3. *Cynanche trachealis.* 4. *Cynanche pharyngæa.* 5. *Cynanche parotidæa.* See the following articles.

CYNA'NCHE TONSILLA'RIS; the *Inflammatory* QUINSY. This is an inflammation of the mucous membrane of the fauces, affecting principally that congeries of mucous follicles which forms the tonsils; and from thence spreading along the velum and uvula, so as frequently to affect every part of the mucous membrane. The disease first appears by a tumor and redness of the parts; is attended with a painful and difficult deglutition; a troublesome clamminess of the mouth and throat; a frequent but difficult excretion of mucus; and the whole is accompanied with pyrexia. The inflammation and tumor are commonly at first most considerable in one tonsil; and afterwards, abating in that, increase in the other. This disease, which is not contagious, is commonly occasioned by cold externally applied, particularly about the neck. It affects especially the young and sanguine; and a disposition to it is often acquired by habit. It occurs especially in the spring and autumn, when the vicissitudes of heat and cold so frequently take place. It terminates frequently by resolution, sometimes by suppuration, but hardly ever by gangrene; though, in some cases, sloughy spots appear on the fauces.

As the principal morbid affection in this disease, on which all its characterising symptoms immediately depend, is the active inflammation in the tonsils and neighbouring parts, the object first and

principally to be aimed at in the cure, is to obtain a resolution of this inflammation. Sometimes, however, it is necessary to have recourse to remedies, with the view of obviating urgent symptoms, before a resolution can be effected; and in other cases, where a resolution cannot be obtained, it must be the aim of the practitioner to promote a speedy and favourable suppuration. After suppuration has taken place, the proper means of promoting a discharge of the purulent matter will conclude the cure; and, to effect this, nothing is so beneficial as fumigating the throat frequently, by means of a funnel placed over a vessel of boiling water, into which some lumps of camphor are thrown. While there is a chance of preventing the formation of pus, some local bleeding may be necessary; and also large and general evacuations from the arm are beneficial. The opening of the ranular veins is held to be an insignificant remedy, according to Dr. Cullen; but it is recommended as an efficacious one by Sir John Pringle: more benefit, however, may in general be derived from leeches to the external fauces. The inflammation may be often relieved by moderate astringents, and particularly by acids applied to the parts affected. Dr. Saunders, of London, directs the following gargle to be used, but not too frequently:

℞ Acidi muriat. gutt. xxx.
Mellis rosæ ℥ij.
Decocti hordei ℥vj. Misce.

Besides these, blistering, and still more frequently rubefacient medicines, are applied with success, as well as the antiphlogistic purgatives; and every part of the antiphlogistic regimen is to be observed, except the application of cold. Sir John Pringle recommends a thick piece of flannel, moistened with spirit of hartshorn and oil, to be applied to the throat, and renewed every four or five hours.

These means, employed after bleeding, either carry off, or at least lessen the inflammation. When the disease has a tendency to suppuration, nothing will be more useful than the taking into the fauces the steams of camphor and warm water, as mentioned above. Benefit is also obtained from poultices applied to the external fauces. Dr. Fordyce directs briony root, chamomile flowers, and other emollient vegetables, with a little hog's lard, to be applied in that way. He observes also, that the inflammation may sometimes be diminished, by augmenting the secretion from the mucous glands of the mouth and throat; and that we are to endeavour to prevent the mucous membrane from being affected by the salts of the thin mucus.

℞ Aq. Cinnam. Ten. ℥viij.
Oxymel. Scillit. ℥ss.
M. Ft. Gargarisma. Utatur sæpius.

℞ Syr. ex Althæa
Ol. Amygdalæ aa ℥j.
Conserv. Cynosb. ℥ss. Misce fiat Linctus.
Cap. coch. unum parvum frequenter.

If the inflamed parts suppurate, the mouth and throat are to be kept moist with the infus. sem. lini, sweetened with sugar or liquorice. If no fluid can be gotten into the stomach, the blood-vessels may be supplied, in some measure, by clysters of starch and sugar, milk, or nutritious broths.

When the abscess is attended with much swelling, if it does not break, it ought to be opened by a lancet; and this does not require much hesitation, as even the inflammatory state may be relieved by some scarification of the tonsils. When this disease runs very rapidly to such a height as to threaten suffocation, it is sometimes necessary to have recourse to bronchotomy, as the only means of saving the life of the patient. But there is reason to believe, that this operation has sometimes been employed where it was unnecessary: indeed we may safely venture to say, that it is but seldom requisite; insomuch that Dr. Cullen tells us, he has never, in his practice, seen any case requiring bronchotomy.

CYNANCHE MALIGNA; *the malignant, putrid*, or *ulcerous Sore Throat*. This disease is not particularly described by the ancient physicians; though perhaps the Syrian and Egyptian ulcers mentioned by Aretæus Cappadox, and the pestilent ulcerated tonsils we read of in Aetius Amideus, were of this nature. Some of the scarlet fevers mentioned by Morton seem also to have approached near to it. In the beginning of the last century, a disease exactly similar to this is described by the physicians of that time, as raging with great violence and mortality, in Spain and some part of Italy; but no account of it was published in this country till the year 1748, when a very accurate one was drawn up by Dr. Fothergill, and in 1752 by Dr. Huxham. The latter observes, that this disease was preceded by long, cold, and wet seasons; by which, probably, the bodies of people were debilitated, and more apt to receive contagion, which possibly also might be produced by the stagnant and putrid waters.

The attack of this disease was very different in different persons. Sometimes a rigor, with fulness and soreness of the throat, and painful stiffness of the neck, were the first symptoms complained of. Sometimes alternate chills and heats, with some degree of giddiness, drowsiness, or head-ach, ushered in the disease. It seized others with much more feverish symptoms; great pain of the head, back, and limbs; a vast oppression of the præcordia, and continual sighing. Some grown persons went about for some days in a drooping state, with much

uneasiness and anxiety, till at last they were oblig-ed to take to their beds. Thus various was the disease, says Dr. Huxham, at the onset. But it commonly began with chills and heats, load and pain of the head, soreness of the throat, and hoarse-ness; some cough, sickness at stomach, frequent vomiting and purging, in children especially, which were sometimes very severe; though a contrary state was more common to the adult. There was in all a very great dejection of spirits, very sudden weakness, great heaviness on the breast, and faint-ness, from the very beginning. The pulse in ge-neral was quick, small, and fluttering, though sometimes heavy and undulating. The urine was commonly pale, thin, and crude; however, in many grown persons, it was in small quantities and high-coloured, or like turbid whey. The eyes were heavy, reddish, and as it were weeping; the coun-tenance very often full, flushed, and bloated, though sometimes pale, and sunk.

How slight soever the disorder might appear in the day-time, at night the symptoms became greatly aggravated, and the feverish habit very much in-creased, nay, sometimes a delirium occurred on the very first night; and this exacerbation constantly returned through the whole course of the disease. Indeed when it was considerably on the decline, our author says he has been often pretty much surprised to find his patient had passed the whole night in a phrenzy, whom he had left tolerably cool and sedate in the day.

Some few hours after the seizure, and sometimes cotemporary with it, a swelling and soreness of the throat was perceived, and the tonsils became very tumid and inflamed, and many times the parotid and maxillary glands swelled very much, and very suddenly, even at the very beginning; sometimes so much as even to threaten strangulation. The fauces also very soon appeared of a high florid red, or rather of a bright crimson colour, very shining and glossy; and most commonly on the uvula, tonsils, velum palati, and back part of the pha-rynx, several whitish or ash-coloured spots appeared scattered up and down, which oftentimes increased very fast, and soon covered one or both the tonsils, uvula, &c. these, in the event, proving sloughs of superficial ulcers (which sometimes, however, eat very deep into the parts). The tongue at this time, though only white and moist at the top, was very foul at the root, and covered with a thick yellowish or brown coat. The breath also now began to be very nauseous; which offensive smell increased hourly, and in some became at length intolerable, and that too, sometimes, even to the patients them-selves.

The second or third day, every symptom became much more aggravated, and the fever much more considerable; and those that had struggled with it tolerably well for thirty or forty hours, were forced to submit. The restlessness and anxiety greatly increased, as well as the difficulty in swallowing. The head was very giddy, pained, and loaded; there was generally more or less of a delirium; sometimes a pervigilium and perpetual phrenzy, though others lay very stupid, but often starting and muttering to themselves. The skin was very hot, dry, and rough; there was very rarely any dispo-sition to sweat. The urine was pale, thin, crude; often yellowish and turbid. Sometimes a vomiting was urgent, and sometimes a very great looseness, in children particularly. The sloughs were now much enlarged, and of a darker colour, and the surrounding parts tended much more to a livid hue. The breathing became much more difficult; with a kind of a rattling stertor, as if the patient was ac-tually strangling, the voice being exceeding hoarse and hollow, exactly resembling that from venereal ulcers in the fauces. This sound in speaking and breathing was so peculiar, that any person in the least conversant with the disease might easily know it by this odd noise; from whence indeed the Spanish physicians gave it the name of *garotillo*, expressing the noise made by persons when they are strangling with a rope. Our author never observed in any of them the shrill barking noise that we frequently hear in inflammatory quinsies. The breath of all these persons was very nauseous; of some insufferably fœtid, especially in the advance of the disorder to a crisis; and many, about the fourth or fifth day, spit off a vast quantity of very purulent mucus, tinged sometimes with blood; and sometimes the matter was quite livid, and of an abominable smell. The nostrils likewise, in many, were greatly inflamed and excoriated, continually dripping down a most sharp ichor or sanious mat-ter, so excessively acrid, that it not only corroded the lips, cheeks, and hands of the children that laboured under the disease, but even the fingers and arms of the very nurses that attended them. As this ulceration of the nostrils came on, it commonly caused an almost incessant sneezing in children; but few adults were affected with it, at least to any considerable degree. It was surprising what quan-tities of matter some children discharged in this way, they would often rub it on their face, hands, and arms, and blister them all over. A sudden stoppage of this rheum from the mouth and nostrils actually choaked several children; and some swal-lowed such quantities of it, as occasioned excoria-tions of the intestines, violent gripings, dysentery, &c. nay, even excoriations of the anus and but-tocks. Not only the nostrils, fauces, &c. were greatly affected by this extremely sharp matter, but the wind-pipe itself was sometimes much cor-roded by it, and pieces of its internal membrane were spit up, with much blood and corruption; and the patients lingered on for a considerable time, and at length died tabid; though there were more

frequent instances of its falling suddenly and violently on the lungs, and killing in a peripneumonic manner.

Dr. Huxham was astonished sometimes to see several swallow with tolerable ease, though the tumor of the tonsils and throat, the quantity of thick mucus, and the rattling noise in breathing, were very terrible; which he thinks pretty clearly shows, that this malignant quinsy was more from the acrimony and abundance of the secretions than the violence of the inflammation.

Most commonly the angina came on before the exanthemata; but many times the cuticular eruption appeared before the sore throat, and was sometimes very considerable, though there was little or no pain in the fauces: on the contrary, a very severe angina seized some patients that had no manner of eruption; and yet, even in these cases, a very great itching and desquamation of the skin sometimes ensued; but this was chiefly in grown persons, very rarely in children. In general, however, a very considerable efflorescence broke out on the surface of the body, particularly in children; and it most commonly happened the second, third, or fourth day: sometimes it was partial, sometimes it covered almost the whole body, though very seldom the face: sometimes it was of an erysipelatous kind; sometimes more pustular: the pustules frequently eminent, and of a deep fiery red colour, particularly on the breast and arms; but oftentimes they were very small, and might be better felt than seen, and gave a very odd kind of roughness to the skin. The colour of the efflorescence was commonly of a crimson hue, or as if the skin had been smeared over with juice of raspberries, and this even to the fingers ends; and the skin appeared inflamed and swoln, as it were; the arms, hands, and fingers, were often evidently so, and very stiff, and somewhat painful. This crimson colour of the skin seemed indeed peculiar to this disease. Though the eruption seldom failed of giving some manifest relief to the patient, as to anxiety, sickness at stomach, vomiting, purging, &c. yet there was observed an universal fiery eruption on some persons, without the least abatement of the symptoms, nay almost every symptom seemed more aggravated, particularly the fever, oppression, anxiety, and delirium; and our author knew more than one or two patients die in the most raging phrenzy, covered with the most universal fiery rash he ever saw; so that, as in the highly confluent small-pox, it seemed only to denote the malignity of the disease.

He had under his care a young gentleman, about twelve years of age, whose tongue, fauces, and tonsils, were as black as ink. He swallowed with extreme difficulty; and continually spit off immense quantities of a black, sanious, and very fœtid matter, for at least eight or ten days:—about the seventh day, his fever being somewhat abated, he was attacked with a dysentery, though the bloody, sanious, fœtid expectoration still continued, with a most violent cough. He at length indeed got over it, to the very great surprise of every one that saw him. Now, in this patient, a severe and universal rash broke out upon the second and third day; and the itching of his skin was so intolerable, that he tore it all over his body in a most shocking manner: yet this very great and timely eruption very little relieved his fever and delirium, or prevented the other dreadful symptoms mentioned.

An early and kindly eruption, however, was most commonly a very good omen: and, when succeeded by a very copious desquamation of the cuticle, one of the most favourable symptoms that occurred; but when the eruption turned of a dusky or livid colour, or prematurely or suddenly receded, every symptom grew worse, and the utmost danger impended, especially if purple or black spots appeared promiscuosly, as sometimes happened; the urine grew limpid, and convulsions came on, or a fatal suffocation soon closed the tragedy.

The disease was generally at the height about the fifth or sixth day in young persons, in the elder not so soon; and the crisis many times was not till the eleventh or twelfth, and then very imperfect: some adults, however, were carried off in two or three days; the distemper either falling on the lungs, and killing in a peripneumonic manner; or on the brain, and the patient either died raving or comatose. In some, the disease brought on a very troublesome cough, purulent expectoration, hæmoptoë, and hectic; in which they lingered on for several weeks, and then died tabid.

If a gentle perspiration came on the third or fourth day; if the pulse became more slow, firm, and equal; if the sloughs of the fauces cast off in a kindly manner, and appeared at the bottom tolerably clean and florid; if the breathing was more soft and free, and some degree of vigour and quickness returned in the eyes; all was well, and a salutary crisis followed soon by a continuance of the sweat, and a turbid, subsiding, farinaceous urine, a plentiful expectoration, and a very large desquamation of the cuticle. But if a rigor came on, and the exanthemata suddenly disappeared or turned livid; if the pulse grew very small and quick, and the skin remained hot and parched as it were, the breathing more difficult, the eyes dead and glassy, the urine pale and limpid, delirium or coma succeeded, with a coldish clammy sweat on the face or extremities, life was despaired of; especially if a singultus and choaking or gulping in the throat attended, with sudden, liquid, involuntary, livid stools, intolerably fœtid. In some few patients Dr. Huxham observed, some time before the fatal period, not only the face bloated, sallow, shining, and greasy as it were, but the whole neck

very much swoln, and of a cadaverous look; and even the whole body became in some degree œdematous; and the impression of a finger would remain fixed in a part, the skin not rising again as usual; an indication that the blood stagnated in the capillaries, and that the elasticity of the fibres was quite lost.

Medical writers are still much divided in opinion, whether the cynanche maligna is to be considered as the same disease with the scarlatina anginosa, afterwards to be treated of, or not. This question will, under that head, be more fully discussed. At present we shall only observe, that although ulcerous sore throats of a malignant nature often appear sporadically, yet that the disease above described appears only as an epidemic, and is always the consequence of contagion.

Since the accurate accounts given by Drs. Fothergill and Huxham, of the epidemics which prevailed about sixty years ago, this disease has frequently been observed, at times epidemic, in almost every different part of Britain. Like small-pox, measles, and hooping-cough, it seems in every case to be the effect of a peculiar and specific contagion. It has been observed to prevail equally generally in every situation, and at every season; and on exposure to the contagion, no age, sex, or condition, is exempted from it. But the having once had the disease, seems in this affection to afford the same security against future contagion as in the small-pox; at least instances, where it can be said that the same individual has been twice affected with it, are both very rare and very doubtful, as well as in small-pox.

Like other febrile contagions, the malignant ulcerous sore throat is terminated only by a natural course; and the chief business of the practitioner is to combat unfavourable occurrences. In this the septic tendency of the disease is chiefly to be kept in view. The debility with which it is attended renders all evacuations by bleeding and purging improper, except in a few instances on the first attack, where the debility is less, and the inflammatory symptoms more considerable. The fauces are to be preserved from the effects of the acrid matter poured out upon them, and are therefore to be frequently washed out by gargles of sage tea and vinegar, or by the following, which Dr. Saunders recommends to procure a separation of the sloughs:

℞ Decoct. cinchonæ ℥vj.
Acidi vitriol. dilut. ʒj.
Mellis rosæ ʒj.
Misce fiat gargarisma quocum os et fauces sæpé de die colluantur.

℞ Oxymel. Æruginis ℥ss.
Mellis rosæ ℥ij.
Decocti hordei ℥iiis.
M. fiat gargarisma.

Dr. Saunders observes, that this disease should be distinguished from the inflammatory angina, and from a particular species of epidemic sore throat, which has lately appeared in this country, attended with much pain and difficult deglutition, violent head-ach with inflamed eyes, sometimes an universal redness and eruption on the skin. A diaphoresis. he observes, may be brought on by the following:

℞ Aquæ ammon. acet. ℥ij.
Vini antim. tart. ʒj.
Mist. camphorat. ℥iv.
M. sumat cochlearia iij. sexta quaque hora.

Sometimes a diarrhœa occurs, and this may be moderated thus:

℞ Kino in pulv. trit. ℈j.
Pulv. cretæ comp. cum Opio gr. x.
Misce fiat pulvis, vel syrupum zingiberis addendo, bolus, ad alvum contrahendum mane sumendus.

The putrescent state of the whole system should be guarded against and corrected by internal antiseptics, especially by the cinchona bark given in the beginning and continued through the course of the disease. The vitriolic and muriatic acids also have been highly extolled, and are productive of the best effects, when they can be introduced to a sufficient extent. On the first attack of this disease, emetics may prove useful. When any considerable tumor occurs, blisters applied externally to the throat will be of service, and in any case may be proper to draw off existing inflammation. The internal use of the *capsicum annuum*, or Cayenne pepper, has been highly celebrated in this affection. It has been employed with singular success in the West Indies, and in many cases which have occurred in this country.

CYNA'NCHE TRACHEA'LIS, the disease popularly named the CROUP. Dr. Home says it usually attacks infants after they have been weaned; the younger they are, after this period, the more they are liable to the disease. The frequency of it becomes less as children become more advanced; and there are few instances of children above twelve years of age being affected with it. It attacks children of the midland counties, as well as those who live near the sea; but it occurs much more frequently at certain places than at others. It does not appear to be contagious; and its attacks are frequently repeated on the same child. It is often manifestly the effect of cold applied to the body; and therefore appears most frequently in the winter and

spring seasons. It very commonly comes on with the ordinary symptoms of a catarrh; but sometimes the peculiar symptoms of the disease show themselves at the very first.

These peculiar symptoms are the following: a hoarseness, with some shrillness and ringing sound, both in speaking and coughing, as if the noise came from a brazen tube. At the same time, there is a sense of pain about the larynx, some difficulty of respiration, with a whizzing sound in inspiration, as if the passage of the air were straitened. The cough which attends it is commonly dry; and if any thing be spit up, it is a matter of a purulent appearance, and sometimes films resembling portions of a membrane. With all these symptoms, there is a frequency of pulse, a restlesness, and an uneasy sense of heat. When the internal fauces are viewed, they are sometimes without any appearance of inflammation; but frequently a redness, or even swelling, appears; and sometimes there is an appearance of matter like to that rejected by coughing, together with the symptoms now described, and particularly with great difficulty of breathing, and a sense of strangling in the fauces, by which the patient is sometimes suddenly taken off.

Many dissections have been made of infants who had died of this disease, and almost constantly there has appeared a preternatural substance, apparently membranous, lining the whole internal surface of the upper part of the trachea, and extending in the same manner downwards into some of its ramifications. This preternatural membrane may be easily separated, and somctimes has been found separated in part, from the subjacent proper membrane of the trachea. This last is commonly found entire, that is, without any appearance of erosion or ulceration; but it frequently shows the vestiges of inflammation, and is covered by a matter resembling pus, like to that rejected by coughing; and very often a matter of the same kind is found in the bronchiæ, sometimes in considerable quantity.

From the remote causes of this disease; from the catarrhal symptoms commonly attending it; from the pyrexia constantly present with it; from the same kind of preternatural membrane being found in the trachea when the cynanche maligna is communicated to it; and from the vestiges of inflammation on the trachea discovered upon dissection, we must conclude, that this disease consists in an inflammatory affection of the mucous membrane of the larynx and trachea, producing an exudation analogous to that found on the surface of inflamed viscera, and appearing partly in a membranous crust, and partly in a fluid form resembling pus.

Nevertheless, it does not commonly end either in suppuration or grangrene. The troublesome circumstance of it seems to consist in a spasm of the muscles of the glottis, threatening suffocation. When this disease terminates in health, it is by a resolution of the inflammation, by ceasing of the spasm of the glottis, by an expectoration of the matter exuding from the trachea, and of the crusts formed there; and frequently it ends without any expectoration, or at least with such only as attends an ordinary catarrh. But in some instances, a salutary termination has very speedily taken place, in consequence of the discharge of the membranous substance from the trachea, even under its proper tubular form. When the disease ends fatally, it is by a suffocation seemingly depending upon a spasm affecting the glottis; but sometimes, probably, depending upon a quantity of matter filling the bronchiæ, or obstructing the trachea.

With respect to the cure, the following method has been recommended by Mr. Kendrick, of Warrington. If the disease take place in a child of a plethoric habit, as is most commonly the case, blood should be immediately taken either from the arm or jugular vein, and that in proportion to the violence of the symptoms. Topical bleeding, by leeches applied to the throat, is likewise of very considerable service, after which, a blister extending across the throat should follow. In the mean while, the inspissated lymph should be dislodged, if possible, by emetics, which should be repeated as often as an increased difficulty of breathing indicates a fresh accumulation. For this purpose we may use tartarised antimony, but Mr. Kendrick says, it will be found, that more considerable doses of it may be administered in this disease than any other, to produce the desired effect. Perhaps other emetics might be more suddenly effectual, but its tastelessness is one motive for preferring antimony. Of late the *Seneka Root* has been strongly recommended for this purpose by an American practitioner, and the warm bath has also been tried, though with no great benefit to the patient.

These are the most material of the remedies to be employed when the disease is purely inflammatory; but Mr. Kendrick apprehends it is often but little so; nay, that it is frequently *almost entirely spasmodic.* Hence he was led to introduce opium, as a new remedy, in these cases. During the year 1794, when this disease raged in his neighbourhood, and also on various occasions since that time, the exhibition of this remedy was attended with success. Whenever it was not used, the disease proved "*invariably fatal;*" whilst, under its use, "*by far the greater number of children recovered.*"* When given for this purpose, pretty large doses are generally requisite. Five, six, or eight drops of tinct. opii, Mr. Kendrick says, may be given every two hours, until sleep, or a remission of the spasm, take place. This, however, he never thought it prudent to do until the usual evacuations had been previously made; and through the whole disease he had recourse to emetics once or twice a day, if there appeared reason to suspect lymph or mucus to be

accumulated in the trachea. It has in general happened, that in three or four days the farther continuance of opium became unnecessary.

CYNA'NCHE PHARYNGEA. This is not materially different from the cynanche tonsillaris; only the inflammation is said to begin in the pharynx, though Dr. Cullen says he never knew an instance of it. The symptoms are almost the same, and the cure is precisely so with that of the cynanche tonsillaris.

CYNA'NCHE PAROTIDÆA, the MUMPS; a disease well known to the vulgar, but little taken notice of by medical writers. It is often epidemic, and manifestly contagious. It comes on with the usual symptoms of pyrexia, which are soon after attended with a considerable tumor of the external fauces and neck. The swelling appears first as a glandular moveable tumor at the corner of the lower jaw; but it soon becomes uniformly diffused over a great part of the neck, sometimes on one side only, but more commonly on both. The swelling continues to increase till the fourth day; but from that period it declines, and in a very few days more, goes off entirely. As the swelling of the fauces recedes, it not unfrequently happens that some tumor affects the testicles in the male sex, or the breasts in the female. These tumors are sometimes large, hard, and somewhat painful; but are seldom either very urgent or of long continuance. The pyrexia attending this disease is commonly slight, and goes off with the swelling of the fauces; but sometimes when the swelling of the testicles does not succeed to that of the fauces, or when the one or the other has been suddenly repressed, the pyrexia becomes more considerable, is often attended with delirium, and has sometimes proved fatal.

As this disease commonly runs its course without either dangerous or troublesome symptoms, so it hardly requires any remedies. An antiphlogistic regimen, and avoiding cold, are all that will be commonly necessary. But when, upon the receding of the swellings, the pyrexia comes to be considerable, and threatens an affection of the brain, it will be proper, by warm fomentations, to bring back the swelling; and by antimonial vomits, bleeding, or blistering, to obviate the consequences of its absence. In this view, stimulating fomentations may be used; or it may be proper to rub the swelled parts with some volatile liniment.

CYNA'NCHUM, DOG'S-BANE, a genus in Linnæus's botany. He enumerates fourteen species.

CY'NARA. See CINARA.

CY'NARA SCO'LYMUS; the systematic name of the artichoke. See CINARA.

CY'NICUS, (from κυνικος, *canine*); certain convulsions, called *Cynic Spasms.*

CYNOCE'PHALON, a species of ANTIRRHINUM.

CYNOCRA'MBE, (κυνοκραμβη; from κυων, *a dog*, and κραμβη, *cabbage*; a herb of the cabbage tribe, with which dogs are said to physic themselves); DOG'S MERCURY; the *Mercurialis perennis*, Linn. It is a poisonous plant, very common in our hedges, and of the narcotic class. See the article POISONS. It produces vomiting and purging, and the person who has taken it soon goes to sleep, from which he does not often awake.

CYNODO'NTES, (κυνοδοντες, from κυων, *a dog*, and οδυς, *a tooth*); the canine teeth.

CYNOGLO'SSUM, (κυνογλωσσον; from κυων, *a dog*, and γλωσση, *a tongue*: so named from its supposed resemblance); also called *lingua canina*, HOUND'S-TONGUE. This plant is the *cynoglossum officinale: staminibus corolla brevioribus; foliis lato-lanceolatis, tomentosis, sessilibus*, of Linnæus. It possesses narcotic powers, but is seldom employed medicinally at present. To counteract the ill effects from an over dose of this, we must speedily attempt to clear the stomach by active emetics.

CYNOGLO'SSUM OFFICINA'LE; the systematic name for hound's-tongue. See CYNOGLOSSUM.

CYNOMO'RIUM COCCI'NEUM; the systematic name of the *fungus melitensis.* See FUNGUS MELITENSIS.

CYNORE'XIA, (κυνορεξια; from κυων, *a dog*, and ορεξις, *appetite*); a voracious or canine appetite. See BULIMIA.

CYNO'SBATOS. See CYNOSBATUS.

CYNO'SBATUS, (from κυων, *a dog*, and βατος, *a thorn*; so called, because dogs are said to be attracted by its smell); the dog-rose, wild briar, or HIP tree. It is the *rosa canina germinibus ovatis pedunculisque glabris, caule petiolisque aculeatis*, of Linnæus. Class, *Icosandria.* Order, *Polygynia.* The red fruit of this tree, called hips, has a sourish taste, and obtains a place in the London pharmacopœias in the form of conserve. It is seldom employed but to give form to more active remedies, in pills, boluses, linctuses, &c.

CY'PERUS LONGUS, (κυπειρος; from κυπαρος, *a little round vessel*, which its roots are said to resemble); CYPERUS, or English galangal. *Cyperus longus; culmotriquetro folioso, umbella foliosa supradecomposita; pendunculis nudis, spicis alternis*, Linn. The smell of the root of this plant is aromatic, and its taste warm, and somewhat bitter; but notwithstanding these indications of an active principle, it is now totally fallen into disuse.

CY'PERUS ROTU'NDUS; the round cyperus, *Cyperus rotundus; culmo triquetro subnudo, umbella decomposita; spicis alternis linearibus*, Linn. This has been preferred to the former, as possessing a more gratefully aromatic bitter. It is used to strengthen the stomach.

CYPHO'MA, (κυφωμα, from κυφοω, *to bend*); a kind of gibbosity, or incurvation of the spine of the back, when the vertebræ incline preternaturally outwards.

CYPRESS SPURGE. See ESULA MINOR.

CYRTO'MA, (κυρτωμα, from κυρτος, *hump-backed*); any preternatural tumor, or gibbosity. In Vogel's Nosology it signifies a particular flatulent tumor of the belly.

CY'STICÆ ARTE'RIÆ, (from κυστις, *the bladder*); the *cystic arteries*. The hepatic artery advances behind the ductus hepaticus towards the vesicula fellis, to which it gives two principal branches. These are called *arteriæ cysticæ*.

CY'STICÆ VENÆ. These precede the vena portæ. They run along the vesicula fellis, from its neck to the bottom; and as they are often only two in number, they have been called *cysticæ gemellæ*.

CY'STICUS DUCTUS, (from κυστις, *a bladder*). The neck of the gall-bladder being formed by the contraction of its small extremity, this neck, bending afterwards, produces a narrow canal called the *ductus cysticus*. It conveys the gall-bladder to the duodenum.

CY'STIS, (κυστις, a *cyst* or *bag*); a term applied to any membranous receptacle of morbid humours which has no outlet.

CYSTI'TIS, (κυστιτις; from κυστις, *the bladder*), inflammation of the bladder; a genus of disease arranged by Cullen in the class *pyrexiæ*, and order *phlegmasiæ*. Inflammation of the exterior coats of the bladder differs from the abrasion, exulceration, or inflammation of the internal, or mucous membrane. It is produced by the causes of internal inflammation; by the rubbing, or pressure of a stone; external hurts; and by strictures in the urethra. The neck of the bladder is thicker than any other part, and more exposed to injury from the stone and bruises. The stone in the bladder, however, more commonly produces an inflammation, or abrasion of the mucous membrane, than this disease.

This inflammation begins with a violent pain in the region of the bladder, *i. e.* in the *perinæum*, or in the belly, immediately above the *pubis*, deep seated, and sometimes attended by a redness in those parts. If the neck be the part affected, there is a retention of urine, together with a constant *stimulus* to its evacuation: if the bottom be the part diseased, there is a continual dribbling, with great efforts to throw out a larger quantity at a time, which the patient conceives to be contained in the bladder. The symptoms are accompanied with frequent attempts to expel the *fæces*, with which the *rectum* appears to the patient to be always loaded; these increase the pain very much, particularly when any *fæces* are actually contained, and especially if they be hard. The pulse is frequent and hard, the extremities become cold, there is immense anxiety and restlessness, with sickness, vomiting, delirium, and the other symptoms of irritation, as in an inflammation of the intestines, and the patient, for the most part, is cut off in a short time.

It also frequently terminates in gangrene and mortification; in which case the pain goes off, but the other symptoms continue, and the patient dies soon after. Or it may be carried off by an increased secretion of *mucus* from the internal membrane, gradually relieving the symptoms; or by a *metastasis*. Or if the disease should not be so violent, especially when the neck of the bladder is the part affected, it may proceed to suppuration, most of the symptoms going off; uncertain rigors and coldness taking place; and a difficulty in making water, or a total retention of it, with a constant irritation to its evacuation, or a *tenesmus*, with a sense of weight (as the abscess occupies the neck or *fundus*), remaining till the *pus* is evacuated. The matter may make its way into the bladder, and come away with the urine, leaving an ulcer there: or into the cellular membrane, and from thence externally by the *perinæum*, after destroying the circumjacent parts in its passage, and producing a *sinuous* ulcer; or it may get through the *peritonæum* into the *abdomen*, when it generally brings on fatal symptoms. The ulcers in the bladder and *perinæum* are of difficult cure.

Cystitis should be distinguished from all inflammations of the circumjacent parts, and from retention of urine produced by other causes. It is to be cured by the common means of *resolution* in internal inflammations; as bleeding, relaxants, &c. These are to be employed immediately on the appearance of the disease, and prosecuted with vigour, or it will soon be fatal. There should be added gentle laxatives, or clysters, to keep the belly open, especially the first; as clysters, by pressing on the bladder, when a part near the *rectum* is inflamed, may be detrimental, and should therefore only be used when there are indurated *fæces*. If there should be external symptoms, emollient fomentations and poultices, with camphorated oil, are to be applied; taking care that they do no hurt by their pressure, and that the cloths or materials be not too moist, lest the water should run upon the linen and bed clothes. If there should be no external symptoms, the skin of the belly and *perinæum* is to be rubbed with rubefacient liniments, which are preferable to blisters, on account of the inconvenience from the absorption of cantharides. The drink should be mucilaginous decoctions; and these, if the urine be retained from a stricture in the neck of the bladder, given only in small quantities. In this case, too, it is necessary to evacuate the urine by art, to avoid gangrene and mortification; but this should be done with great caution. If, notwithstanding the use of these remedies, and after sufficient evacuation, a spasmodic contraction and pain should continue; opiates, as in inflammations of the intestines, may sometimes

be useful, and also the warm bath. If the bladder suppurate, the *pus* is to be evacuated as soon as possible, and the remedies recommended in ulcers of the kidneys are to be employed.

The inflammation of the bladder from *internal causes* is a very rare disease; and when it does at any time occur, is to be cured in the same manner with other inflammations, avoiding only the use of cantharides. When the disease arises from the internal use of these flies, camphor is recommended, besides other cooling medicines, and particularly cooling and emollient clysters.

CYSTOCE'LE, (κυστοκηλη; from κυϛις, *the bladder*, and κηλη, *a tumor*); a hernia formed by the protrusion of the urinary bladder.

CY'TINUS, (κυτινος; from κυω, *to produce*; so called from its fecundity); the bud or flower of the pomegranate.

CY'TINUS HYPOCI'STIS; the plant from whose fruit the *succus hypocistidis* is obtained. See Hypocistis.

CY'TISUS, base-trefoil, or BEAN-TREFOIL; a genus in Linnæus's botany. There are seventeen species, none of them used in medicine.

D

DAM DAU

DA'CTYLUS, (δακτυλος, *a finger;* so called from the likeness of its fruit to a finger); the DATE. It is an oblong fruit of the *Phœnix dactylifera; frondibus pinnatis; foliolis ensiformibus complicatis*, Linn. Before they are perfectly ripe, dates are rough and astringent; but when sufficiently matured, they are much of the nature of the fig. See Carica. Senegal dates are most esteemed, they having a more luscious yet agreeable flavour, than those of Egypt and other places.

DÆMONOMA'NIA, ((δαιμωνομανια; from δαιμων, *a dæmon*, and μανια, *madness*); that particular species of melancholy, where the patient supposes himself to be possessed with devils.

DAISY, COMMON. See Bellis minor.

DAISY, OX-EYE. See Bellis major.

DAMPS, (from the Saxon word *damp*, signifying vapour or exhalation); certain noxious exhalations issuing from some parts of the earth, and which prove almost instantly fatal to those who breathe them. These damps are chiefly observed in mines and coal-pits: though vapours of the same kind often issue from old lavas of burning mountains; and, in those countries where volcanoes are common, will frequently enter houses, and kill people suddenly without the least warning of their approach. In mines and coal-pits they are chiefly of two kinds, called by the miners and colliers the *choke* and *fire-damps* (See Fire-damp); and both go under one general name of *foul air*. The *choke-damp* is very much of the nature of carbonic acid, or fixed air. See Carbonic acid.

DAMSON, or Damascene, the fruit of the *Prunus damascena*, which, when perfectly ripe, affords a wholesome article of diet. Damsons gently open the body, when ripe; but when not perfectly so, they may produce cholicy pains, diarrhœa, and convulsions in children.

DANDELION. See Taraxacum.

DANDRIF. See Pityriasis.

DANE-WORT. See Ebulus.

DA'PHNE, (δαφνη; from δαω, *to burn*, and φωνη, *a noise;* because of the crackling noise it makes when burnt); the LAUREL or bay-tree.

DA'PHNE, FLAX LEAVES. See Thymelæa.

DA'PHNE GNI'DIUM: the systematic name of the tree which affords the *garou*. See Thymelæa.

DA'PHNE LAUREO'LA; the systematic name of the spurge laurel. See Laureola.

DA'PHNE MEZE'REUM; the systematic name of the mezereon. See Mezereum.

DA'RTOS, (δαρτος; from δερω, *to excoriate*; so called from its raw and excoriated appearance), or Darton. The part so denominated lies under the skin of the scrotum, and is, by some anatomists, considered as a muscle, though it appears to be no more than a condensation of the cellular membrane lining the scrotum. It is by means of the dartos that the skin of the scrotum is corrugated.

DATE PLUM, INDIAN. See Indian date plum.

DATES. See Dactylus.

DATU'RA STRAMO'NIUM, (according to Blancard, derived from *datiro*, Ind. of which he knows not the meaning); the systematic name of the common THORN-APPLE. See Stramonium.

DAU'CUS, (δαυκος, απο τȣ δαυειν, from its relieving the colic and discussing flatulencies); the CARROT. *Daucus carota, seminibus hispidis, petiolis subtus nervosis*, Linn. Class, *Pentandria*. Order, *Digynia*. The root, scraped, and applied in the form of a poultice, is a useful application to phagedenic ulcers, and to cancers and other putrid sores. The seeds, which have a place in the materia medica, afford a light aromatic smell, and a warm acrid taste; and are esteemed for their diu-

retic qualities, and for their utility in calculous and nephritic complaints. The boiled root is said by many to be difficult of digestion, but this is the case only when the stomach is weak. Dr. Cullen says, it contains a considerable quantity of the saccharine principle, and is tender, nutritious, and not very flatulent.

DAU'CUS CARO'TA; the systematic name of the carrot plant. See DAUCUS.

DAU'CUS CRE'TICUS; the CANDIA CARROT; *Athamanta cretensis; foliolis linearibus planis, hirsutis; petalis bipartitis; seminibus oblongis, hirsutis*, Linn. The seeds are brought from the isle of Candia: they have an aromatic smell, and a slightly biting taste; and are occasionally employed, as carminatives and diuretics, in diseases of the primæ viæ and urinary passages.

DAU'CUS SATI'VUS; a variety of the *daucus carota*. The seeds are preferred by some practitioners to the seeds of the other kind.

DAU'CUS SYLVE'STRIS, WILD CARROT or bird's nest. The seeds of this are said to be more efficacious as a medicine than those of the garden carrot. They possess demulcent and aromatic qualities, and are given, in infusion or decoction, in calculous complaints, and with manifest advantage.

DEAD NETTLE. See LABIUM ALBUM.

DEADLY NIGHTSHADE. See BELLADONNA.

DEAFNESS, the state of a person who has entirely lost the sense of hearing, or enjoys it imperfectly. This sense is more frequently vitiated than almost any of the rest, as depending on the functions of a most delicate organ, and one composed of many and very small parts. Hearing may become too acute, either from the general habit of the body being too irritable, such as often happens to hysterical and lying-in-women, or from too great a sensibility of the brain itself, which is not unfrequently observed in fevers, as well as in phrenitis, and sometimes in the true mania; or it may be from a disease of the ear itself, as when it is affected with inflammation, pain, or violent tension. The hearing may be rendered dull, or even altogether destroyed, so that the person shall become totally deaf, from the same causes acting with different degrees of force. This happens especially from the want of the external ear; or from the meatus auditorius being stopped up with mucus, wax, or other matters; or from the sides of the canal growing together, as sometimes happens after suppuration or the small-pox; or if the membrane of the tympanum become rigid or relaxed, or be eroded or ruptured; or the tympanum itself, or the Eustachian tube, may from certain causes be obstructed; or some of the little bones or membranes, or some of the muscles of the labyrinth itself, may be affected with concretion, spasm, palsy, or torpor; or lastly, it may happen from diseases of the brain and nerves, all the organs of hearing remaining sound. Hence deafness is often a nervous disease, coming suddenly on, and going off of its own accord. Hence also it is common in old people, all of whose solid parts are too rigid, while their nervous parts are too insensible.

1. *Imperforated meatus auditorius.*—Sometimes a *thin membrane* is found to be spread over the external passage, while at other times a considerable part of the passage is *filled up* with a fleshy looking substance, occasioning deafness. When the first circumstance occurs, the skin is easily divided by a simple incision, and the accretion of its sides may be prevented by a little lint, or a bit of bougie, inserted between the edges of the wound, and daily cleaned and returned, till the part be rendered callous. When the other obstacle is present, the incision must be continued considerably deeper, till the resistance be removed, or till the instrument reach near to the membrane of the tympanum, but no farther: then the same kind of after-treatment may be followed as in the other case. The proper time for performing the operation is when children usually begin to speak; for previous to this, the patient may be too weakly to bear it, and if too long delayed, the speech would be impeded. Sometimes the meatus externus is entirely wanting in the temporal bone. For this an opening through the mastoid process has been proposed; but the operation has not been performed, at least in this country.

2. *Extraneous bodies in the ear.*—Children sometimes push *hard bodies* into the ear, or different *insects* occasionally creep into it, so as to cause considerable uneasiness. Substances lying near the outer end of the passage may generally be extracted by the small pointed dissecting forceps; but round, hard bodies, situated deeper in the passage, are more readily removed by the crooked forceps. When insects are deep seated in the ear, they ought first to be killed, by filling the passage with oil, or any other fluid which proves noxious to them, without hurting the tympanum. They may then be washed out by injecting warm water by means of a syringe.

3. *The accumulation of wax.*—This, though one of the most frequent causes of deafness, may be readily detected by looking into the ear in a clear sunshine, or by the flame of a wax taper; which may be still farther aided, by suffering the rays of light to be transmitted through a tumbler of spring water. No method for removing wax from the ear, is superior to that of throwing in frequently, by means of a common syringe or bag, some warm water, or soap and water. Assistance may likewise be given, by using, along with the injection, a blunt probe or fine hair pencil, by which the bottom of the passage may be cleared out. After the wax is removed, the patient ought to guard against the effects of cold, by introducing a little wool, for some time, into the meatus. When deafness is owing to a *deficiency of wax*, a little oil of almonds and spirit of turpentine, soap, galbanum, &c. have been recommended.

4. *Suppurations of the ear.*—Purulent matter is now and then discharged from the ears of adults, but oftener from those of scrofulous children. Sometimes it is produced by ulcers situated in the lining of the meatus, or upon the membrane of the tympanum. It seems to be mostly a local affection, though many have supposed it to originate in a morbid state of the system. The topical remedies best calculated for removing it, are moderate astringents, such as a weak solution of vitriolated zinc. A little of this may be dropped in two or three times a-day, but it is still better to use a syringe. If the discharge has continued long, it may be proper, in addition to the other applications, to keep open a small blister for some time in the neck, arm, or wherever it may be thought most convenient.

In scrophulous habits, suppurations sometimes occur in the neighbourhood of the ear, and penetrate into the external passage, or into the tympanum itself; after which it is not unusual for the small bones of the ear to lose their connecting membrane, and to be discharged along with the matter, and for caries to ensue in the tympanum; in consequence of which a high degree of deafness is produced, which can never be removed. In such a situation little else can be attempted than to preserve the parts clean and free from smell, which is readily done by injecting a little warm water morning and evening by means of a syringe; or it may be cleaned out with a little warm water and a large camel's hair pencil, which may be safely passed to the bottom of the ear. If neglected, the matter from the carious bones is apt to become offensive, and it commonly continues till the diseased parts are either dissolved and discharged, or probably during the life of the patient. 5. *Affections of the Eustachian tube.*—Inflammation and its consequences may originate in the cavity of the Eustachian tube, or swellings or ulcers in the throat may affect it, so as to cause some degree of deafness. When this is the case, it is practicable to introduce a small pipe, crooked at the extremity, through the mouth or nose, and then to inject into the opening of the Eustachian tube, any mild fluid which may be thought fittest for the purpose, though too great dependence should not be placed upon the attempt. Some recommend the chewing of a crust, the use of sternutatories, &c. which by their stimulus, may excite the secretions of the past, and thus dislodge any obstructing matter. But Dr. Sims, in a paper on this subject, recommends holding the breath, and strongly forcing the air outwards in the direction of the tympanum, by which sometimes the passage is suddenly opened.

With regard to *deafness in old persons*, it arises sometimes from exposure to a stream of cold air, the tympanum becomes affected, and a noise is heard by the patient like the rushing of water. In other cases the patient is incapable of accurately distinguishing the words of some persons speaking in a loud tone of voice, or, in mixed companies he hears only a confusion of sounds. Complaints of this kind frequently originate from a relaxation of the soft parts of the tympanum; and though a complete cure is not easily performed, yet considerable advantage is sometimes derived from the use of hot stimulating oils, and from keeping the part warm at the same time with a little wool. When deafness arises from affections of this nature some assistance may be derived from collecting the sound, so as to make a stronger impression upon the internal ear. A variety of instruments have been invented for this purpose. Some use a well-known convoluted tube called an ear-trumpet (see ACOUSTIC); others a sort of metal cup, in the shape of a large ear, which is concealed under the hair, and fixed to the head with springs.

One of the most important discoveries in regard to the means of relieving deafness, is that by Mr. Astley Cooper, of London, by a perforation of the tympanum (see TYMPANUM). This method effected a complete cure, in two recent cases which occurred in France. The first, treated by M. Maunoir, was a man of 40, who had lost his hearing in consequence of a chronic affection of the fauces, which had completely obliterated the Eustachian tube. On perforating the right tympanum with a small trocar, he remained some time stupid, and then exclaimed, "Au mon de Dieu, Messieurs, ne criez pas; vous me faites mal;" although the bystanders were speaking in a low tone of voice. In eight days this excessive sensibility ceased. The left ear was then perforated, without producing any effect. Twenty days after the second operation, his hearing was very little diminished, but there only remained a very small hole in the right tympanum; to prevent it from shutting up, it was performed anew, not without effect; but, on examining the left ear, it was discovered that the tympanum was hid by a false membrane, which alone had been perforated in the second operation. M. Maunoir removed it entirely with a pair of forceps, and then perforated the real tympanum, which, it is remarkable, was followed by the same astonishment and excessive sensibility to sound as the first operation.

The subject of the other case was a lady 59 years of age, subject to catarrhal affections, but who lost her hearing twenty-two years before, during an acute disease. The one tympanum was no sooner pierced, and the trocar withdrawn, than she exclaimed, "J'entends," and requested the surgeon to speak lower. The other tympanum was perforated at the same time, and her hearing was restored, but at first with too great a degree of sensibility. The operator, Dr. Celliez, thinks he has improved on the operation of Mr. Cooper by using a curved trocar, and of a considerably larger size,

as the chance of the perforation healing up is lessened, and, by perforating the tympanum at its lowest and most anterior edge, there can be no current of air, nor much chance of hœmorrhage.

Persons labouring under fevers, especially of the typhous kind, often become deaf. When this comes on along with other signs of an oppressed brain, and a great prostration of strength, it may be a very bad sign; but for the most part it is a very good one, even though accompanied with some degree of torpor or sleepiness.

An odd affection of the sense of hearing is when certain sounds, like those of a drum, a bell, the falling of water, &c. are heard without any tremor in the air, or without another person's hearing any thing: this disease is called *tinnitus aurium*. See Tinnitus aurium.

Those who are born deaf are of course dumb, as not being able to learn any language, at least in the common way. However, the eyes in some measure serve these unfortunate persons for ears, and they may be brought to understand what is said, by observing the motion of the lips, tongue, &c. of the speaker. They may even accustom themselves to move their own, as they see other people do, and by this means learn to speak. Thus it was that Dr. Wallis taught two young gentlemen born deaf to know what was said to them, and to return pertinent answers. The instruction of persons in this unfortunate predicament has since been very successfully carried on by Messrs. Telfair, Braidwood, and others.

It is observable, that deaf persons, and several others dull of hearing, hear better and more easily if a loud noise be raised at the time when we speak to them: heretofore, this was attributed to the greater tension of the tympanum on that occasion. Dr. Wallis mentions a deaf woman, who, if a drum were beaten in the room, could hear any thing very clearly; so that her husband hired a drummer for a servant, that, by this means, he might hold conversation with his wife. But with regard to this opinion, there may be much deception; the sense of feeling being so nearly allied to that of hearing as to convey certain vibrations which afford information to the mind, although the party be completely deaf.

DEATH, a total extinction of the vital principle, or the separation of the soul from the body; in which sense is stands opposed to life, which consists in their union. An animal body, by the actions inseparable from life, undergoes a continual change. Its smallest fibres become rigid; its minute vessels grow into solid fibres no longer pervious to the fluids; its greater vessels grow hard and narrow; and every thing becomes contracted, closed and bound up: whence the dryness, immobility, and extenuation, observed in old age. At length, in the process of these changes, death itself becomes inevitable, as the necessary consequence of life. But it is rare that life is thus long protracted, or that death succeeds merely from the decays and impairment of old age: diseases, a loug and horrid train, cut the work short. See Asthenology.

The *causes of death in fevers* are either direct or indirect. The first are those which directly attack and destroy the vital principle as lodged in the nervous system, or destroy the organs immediately connected with it. The second, or the indirect causes of death, are those which interrupt such functions as are necessary to the due continuance and support of the vital principle.

Of these general causes, those which operate more particularly in fevers seem to be: *First* the violence of reaction, which, either by repeated violent excitements destroys the vital power itself, or, by violence, destroys the organization of the brain necessary to the action of the vital principle, or by the same violence destroys the organization of the parts more immediately necessary to the circulation of the blood. *Secondly*, the cause of death in fevers may be a poison, that is, a power capable of destroying the vital principle; and this poison may be either the miasma or contagion which was the remote cause of the fever, or it may be a putrid matter generated in the course of the fever. In both cases, the operation of such a power appears either as acting chiefly on the nervous system, inducing the symptoms of debility; or, as acting upon the mass of blood, inducing a putrescent state in it, and in the fluids derived from it. From all this the symptoms shewing the tendency to death in fevers may be discovered, by their being either the symptoms of violent reaction, of great debility, or of a strong tendency to putrefaction in the fluids.

The signs of death are in many cases very uncertain; they have proved such in so many instances, that it ought to be a rule never to inter a deceased person, till indisputable marks of putrefaction appear. In many cases of apparent death from suffocation, convulsions, &c. the methods of resuscitation recommended by the Humane Society should be used. See Drowning and Resuscitation.

DEBILITY, in pathology, a relaxation of the solids, occasioning various diseases. These are more prevalent in crouded cities, where luxury, intemperance, and their concomitant vices prevail. See Asthenology and Brunonianism.

Debility takes place, when the motion of the muscles, either voluntary or involuntary, is not performed with sufficient strength. A greater or lesser share of debility, either general or of some particular part, accompanies almost all diseases, and is indeed no small part of them: for it is hardly possible that a disease can subsist for a length of time without inducing some degree of debility. When a state of debility is induced, it renders a

man obnoxious to innumerable disorders, and throws him as it were defenceless in their way. It often depends on the original structure of his body, so that it can be corrected neither by regimen nor medicines of any kind. A different degree of strength also accompanies the different periods of life; and thus in some cases debility cannot be reckoned morbid. But a truly morbid and idiopathic debility arises from the nervous force being diminished; from diseases of the brain and nerves, or of the muscles through which they are distributed; from a decay of the nerves themselves; from a want of the due tension of the fibres, or the fibres themselves becoming torpid; from the body exhausted by spare diet, want, evacuation; or lastly, from diseases affecting the whole body, or some particular parts of it The highest degree of debility, namely, when the strength of the muscles is altogether or nearly destroyed, is *paralysis* or *palsy;* either universal, or belonging only to some particular muscles. See PARALYSIS.

DECAGY'NIA, (from δεκα *ten*, and γυνη, *a woman*), in botany, the name of an order, or secondary division, in the class decandria, of the sexual method, consisting of plants whose flowers are furnished with ten stamina and the same number of styles; which last are considered, by Linnæus and the sexualists, as the female organs of generation in plants. Neurada and American nightshade furnish examples. See BOTANY.

DECA'NDRIA, (from δεκα *ten*, and ανηρ *a husband)*, Linnæus's tenth class, comprehending those hermaphrodite plants which bear flowers with ten stamina. See BOTANY.

DECANTATION, in chemistry, the gently pouring off a liquor from its fæces, by inclining the lip or *canthus* of the vessel; whence the name.

DECI'DUA, (from *decido*, to fall down), or *Membrana decidua;* a very thin and delicate membrane or tunic, which adheres to the gravid uterus. It is found to be a reflexion of the chorion, and, on that account, is called *decidua reflexa.* See CHORION. The decidua comes away, after delivery, in small pieces mixed with the *lochia.*

DECIDUOUS, in botany. The calyx or cup of a flower is said to be *deciduous*, when it falls along with the flower-petals: and, on the contrary, it is called *permanent*, when it remains after they are fallen. Again, deciduous leaves are those which fall in autumn; in contradistinction to those of the ever-greens, which remain all the winter. See DEFOLIATION.

DECOCTION, (from *decoquo*, to boil); a pharmaceutical composition; obtained by boiling one or more ingredients in a watery fluid. In a chemical point of view, it is a continued ebullition with water, to separate such parts of bodies as are only soluble at that degree of heat. Decoction is performed by subjecting the substances operated on to a degree of heat which is sufficient to convert the menstruum into vapour, and can only be employed with advantage for extracting principles which are not volatile, and from substances whose texture is so dense and compact as to resist the less active methods of solution. When the menstruum is valuable, that portion of it which is converted into vapour, is generally saved by condensing it in a distilling apparatus. See DISTILLATION. *Decoct. altheæ offic.—anthem. nob.—chamæmeli,—cinchon. offic.—commune,—corn. cerv.—daph. mezer.—Geoffr. inerm.—guaiac. offic. comp.—helleb. alb.—hordei,—lignorum,—polygalæ seneg.—sarsapar.—ulmi*, &c. appear in our latest pharmacopœias.

DECOMPOSITION, a separation of the parts of a body, by the medium of chemical attraction. See ANALYSIS.

DECORTICATION, (*decorticatio*, from *de*, from, and *cortex*, bark); the stripping any vegetable production of its bark, husk, or shell: thus almonds, and the like, are decorticated, that is, deprived of their pellicle, when used for medicinal purposes.

DECREPITATION, (*decrepitatio; from decrepo*, to crackle), in chemistry, the quick separation of the parts of a body, occasioned by a strong heat, and accompanied with noise and crackling. This effect is most frequently produced by water contained betwixt the parts of the decrepitating body, when these parts have a certain degree of adhesion together. This water being quickly reduced into vapour, by the heat suddenly applied to it, rarefies, and bursts with noise the parts which compress it. The bodies most subject to decrepitation are certain salts, such as common salt, vitriolated kali, &c. the decrepitation of all which proceeds from the water of their crystallization. Clays which are not perfectly dry, and flints, are also subject to decrepitation from the same cause.

DECU'MBENS, (from *decumbo*, to lie down), in botany, decumbent; i. e. drooping, or hanging down.

DECU'RRENS, (from *decurro*, to run along), in botany, decurrent. This term is applied to a leaf, when its basis extends downwards, below the proper termination.

DECURSI'VUS, (from the same), in botany, decursive. This term is applied to a leaf, when the bases of the lesser leaves are continued along the sides of the petiola.

DECUSSATION, (*decussatio*, from *decutio*, to divide). When nerves or muscular fibres cross one another, they are said to decussate each other.

DECUSSA'TUS, (from *decusso*, to divide), in botany, decussated. It means growing in pairs and opposite, each pair being alternately on opposite sides of the stem.

DECUSSO'RIUM, a surgeon's instrument, formerly used to press on the dura mater, and thus cause an evacuation of pus collected between the

cranium and that membrane, through the perforation made by the trepan.

DEER, *dama*, a species of the *cervus*, in the order of *pecora*, in the Linnæan system. The flesh of this animal is named venison. See VENISON.

DEFECATE, in chemistry, to free any fluid body from fæces and impurities.

DEFENSIVE, or DEFENSATIVE, (from *defendo*, to guard), an epithet applied to some topical applications, which are calculated to defend the parts from the external atmosphere, or from accidental friction. The late Dr. Kirkland employed an external dressing, which he called his *defensative*.

DEFERENS VAS, (*deferens*, from *defero*, to convey; because it conveys the semen from the testicle to the vesiculæ seminales). See VAS DEFERENS.

DEFLAGRATION, (*deflagratio*; from *deflagro*, to burn); in chemistry, the kindling or setting fire to any substance, or liquid, in order to separate its combustible from its incombustible parts, and thereby judge of the proportions which each bears to the other. This short process has been often recommended for trying the strength of brandies and other vinous spirits.

DEFLORATUS, (from *de*, and *flos*, a flower); in botany, deflorated; a term applied to those corollæ, which have shed or discharged their petals.

DEFLUXION, (from *defluo*, to run off); a term used by the old physicians to signify a falling of the humours from a superior to an inferior part of the body: as when a swelling of the foot relieved an affection of the head and stomach.

DEFOLIATION, (from *de*, and *folium*, a leaf), in botany, the fall of the leaves; a term opposed to *frondescentia*, the annual renovation of the leaves, produced by the unfolding of the buds in spring. See FRONDESCENTIA. Most plants in cold and temperate climates shed their leaves every year: this happens in autumn, and is generally announced by the flowering of the common meadow-saffron. This term is only applied to trees and shrubs; for herbs perish down to the root every year, losing stem, leaves and all.

DEFORMITY, the want of that uniformity necessary to constitute the beauty or perfect utility of an object. Deformity, in an anatomical sense, relates only to such deviations from the natural form of the human body, or of any part of it, as affect the animal functions. This is the case in deformities of the pelvis, spine, &c.

DEGLUTITION, (from *deglutio*, to swallow down); that action by which the masticated mouthful, or any fluid draught, is conveyed back into the fauces, and from thence through the œsophagus into the stomach. See ŒSOPHAGUS.

The retention of foreign bodies in the œsophagus, is no unfrequent occurrence. To remove these there have been many contrivances; but it would often be better to leave the case to nature, than to deal roughly with so irritable a part, as it is often necessary to bring back the subject swallowed. If the substance can be reached with the fingers, or with a pair of crooked forceps, attempts to extract it may be rationally made. When pins, fish-bones, or such-like bodies, stick across an inaccessible part of the gullet, however, it is quite uncertain whether we shall do good or harm by any attempts to remove them, at least with force, either up or down: the propriety of the attempt must be left to the judgment of the practitioner. If the detained body may be safely pushed down, it is commonly done by means of the PROBANG; that is, a flexible piece of whale-bone, with a piece of sponge secured to its end. It frequently happens, that indigestible bodies have been swallowed without any subsequent inconvenience. If the bodies cannot be easily moved either up or down, our endeavours should not be continued too long, lest the œsophagus should become inflamed. Whilst other means are used, it may be safely recommended, that the patient should swallow some softening liquid, as barley-water, or milk and water, which, alone, in some cases, may remove the obstacle. Whether the swallowing of solid substances be prudent, such as chewed crust of bread, &c. is not so certain. The nature of the thing retained, and other circumstances, must determine that. When, unfortunately, all justifiable endeavours fail, and the body is left in the part, we must treat the patient as if labouring under an inflammatory disease; we should bleed, direct a liquid diet, and apply a poultice round the patient's neck: and the same treatment will be required if an inflammation takes place in the part, though the obstructing body be removed. If the gullet be strongly contracted, so that the patient cannot swallow, he may be supported by means of clysters until relief is obtained. If there be danger of suffocation, the operation of bronchotomy may be had recourse to.

If an indigestible substance passes into the stomach, the patient generally gets rid of it by stool, without any further accident; yet it may be proper that he should live on a mild, smooth diet, consisting chiefly of farinaceous matters, as puddings, soups, &c. carefully avoiding all irritating and heating food.

In the London Medical Observations vol. iii. p. 7. there is an account of a quill being swallowed, and extracted by means of a probang, with a thread or two passing from one end to the other, and fastened to the sponges which were connected with each end of this instrument. In the Medical Museum, vol. ii. are several cases related, of different bodies sticking in the œsophagus, and the methods by which patients were relieved. In the same volume it is observed, that many bodies, whose bulk and figure permit them to pass easily through the intestines,

intestines, are not much to be dreaded when they arrive at the stomach, though they have passed the œsophagus with difficulty. Pieces of money of various sizes have passed by the anus in a few days: pieces of lead, as bullets, &c. have done the same, though sometimes they have been detained for years. In the London Medical Transactions, vol. iii. p. 30. is an account of a crown-piece which a man swallowed; some time after, and on another account, an emetic was given him, yet without any effect with respect to the crown-piece; but some weeks after, he was taken with a sickness and vomited several times, and in vomiting brought up the crown-piece without any pain, after its lying in the stomach from the 12th of March, 1771, to the 26th of November, 1772. We have other instances of nails, pins, &c. swallowed. In the former cases attempts have been made to decompose them in the stomach by acids; but this part of the subject does not belong to the present article.

DELETERIOUS, (*deleterius* of the Gr. δηλητηριος; from δηλεω, *to hurt* or *injure*); an epithet applied to those substances which are of a poisonous nature. See POISONS.

DELIQUESCENCE, (from *deliquesco*, to be dissolved), in chemistry, the property which certain bodies have of attracting moisture from the air, and thereby becoming liquid. This property is mostly found in saline substances, or matters containing them. It is caused by the great affinity which these substances have with water. Though the immediate cause of deliquescence is the attraction of the moisture of the air; yet it remains to be shown, why some salts attract this moisture powerfully, and others, though seemingly equally simple, do not attract it at all. The vegetable alkali, for instance, attracts moisture powerfully; the mineral alkali, though to appearance equally simple, does not attract it at all. The acid of tartar by itself does not attract the moisture of the air; but if mixed with borax, which has a little attraction for moisture, the mixture is exceedingly deliquescent. Some theories have been suggested, in order to account for these and other similar facts; but we are as yet too little acquainted with the nature of the atmosphere, and the relation its constituent parts have to those of terrestrial substances, to determine any thing with certainty on this subject.

DELI'QUIUM, in chemistry, is the dissolution, or melting of a salt or calx by suspending it in a moist cellar. See DELIQUESCENCE.

DELI'QUIUM A'NIMI. See SYNCOPE.

DELI'RIUM, (from *deliro*, to rave); a symptomatic and temporary alienation of mind, evinced by the patient's acting and talking unreasonably. It is to be carefully distinguished from MANIA, which is an alienation of the mind without fever.

Delirium accompanies fevers of many different kinds. Sometimes it is slight, easily removed, and scarce to be accounted a bad sign. Often, however, it is very violent, and one of the very worst symptoms requiring the utmost care and attention. A delirium is either fierce or mild. The fierce delirium is preceded and accompanied by a redness of the countenance, a pain of the head, a great beating of the arteries, and noise in the ears; the eyes in the mean time looking red, inflamed, fierce, shining, and unable to bear the light; there is either no sleep at all, or sleep troubled with horrid dreams; the patient's manners are changed; an unusual peevishness and ill-nature prevail. The depravation of judgment is first observed between sleep and waking, and by the person's crediting his imagination, while the perceptions of sense are neglected, and the ideas of memory occur in an irregular manner. Fury at last takes place, and sometimes an unusual and incredible degree of bodily strength, so that several people can scarce keep a single patient in his bed.

The mild delirium, on the contrary, is often accompanied with a weak pulse, a pale collapsed countenance, and a vertigo when the patient sits in an erect posture: he is seldom angry, but often stupid, and sometimes remarkably grieved and fearful. The loss of judgment, as in the former kind, is first perceived when the patient is half awake; but a temporary recovery ensues upon the admission of light and the conversation of his friends. The patient mutters much to himself, attends little to the things around him; at last, becoming quite stupid, he neither feels the sensations of hunger or thirst, nor any of the other propensities of nature, by which means the urine and excrements are voided involuntarily. As the disorder increases, it terminates in subsultus tendinum, tremors, convulsions, fainting, and death. The other species of delirium also frequently terminates in this, when the spirits and strength of the patient begin to fail.

The symptoms accompanying either of these kinds of delirium show an unusual, inordinate, and unequal motion of the blood through the brain, and a great change in that state of it which is necessary to the exercise of the mental powers. It is sufficiently probable, that an inflammation of the brain, more or less violent or general, sometimes takes place, although the signs of universal inflammation are frequently slight. This we learn from the dissection of dead bodies, which often show an unusual redness of the brain or of some of its parts, or sometimes an effusion or suppuration.

The state of the brain, however, may be much affected, and a delirium induced, by many other causes besides the motion of the blood. In many fevers, typhus for instance, the nervous system is much sooner and more affected than the blood; and though the morbid affections of the nervous

system are as invisible to the senses as the healthy state of it, the symptoms of its injuries plainly show that its action, or *excitement* as some call it, is unequal and inordinate. In this way, too, a delirium is produced by several poisons.

DELPHI'NIUM, (δεγφινιον; from δελφινος, *the dolphin)*, LARKSPUR: formerly so called from the likeness of its flower to the dolphin's head.

DELPHI'NIUM, CONSO'LIDA; the systematic name of the *consolida regalis*. See CONSOLIDA REGALIS.

DELPHI'NIUM STAPHISA'GRIA; the systematic name of staves-acres. See STAPHISAGRIA.

DELTO'IDES, (δελτοειδης, from δελτα, the Greek letter Δ, and ειδος, *a likeness;* shaped like the Greek delta); a muscle of the superior extremity, situated on the shoulder. It arises, fleshy, from all the posterior part of the clavicle that the pectoralis major does not possess; tendinous and fleshy, from the acromion, and lower margin of almost the whole spine of the scapula opposite to the insertion of the cucullaris muscle: from these origins it runs in three different directions; namely, from the clavicle outwards and downwards; from the spine of the scapula outwards, forwards, and downwards; and from the acromion straight downwards; and is composed of a number of fasciculi, which form a strong fleshy muscle that covers the anterior part of the joint of the os humeri. This muscle is inserted, tendinous, into a rough protuberance in the outer side of the os humeri, near its middle, where the fibres of this muscle intermix with some part of the brachialis externus. Its use is to pull the arm directly outwards and upwards, and a little forwards or backwards, according to the different directions of its fibres.

DEME'NTIA, (from *de*, and *mens*, without mind); madness, delirium, absence of intellect. See MANIA.

DEME'RSUS (from *demergo*, to sink down), in botany, a term applied to aquatic plants, which sink in the water where they grow.

DEMULCE'NTIA, (*medicamenta;* from *demulceo*, to soften), *demulcents;* medicines which possess a power of diminishing the effects of stimuli on the sensible solids of the body. These are of two orders: 1. *Lenient demulcents*, as starch, gum-arabic, and olive oil. 2. *Diluent demulcents*, as water and watery substances. Dr. Cullen says, the effects of demulcents are sufficiently evident with respect to the external parts; and it may be presumed that the same may happen with respect to the internal, so far and so long as the acrid particles continue mixed with the remedy. But it is difficult to suppose, that the demulcent matter retains its mild and inviscating quality, after it has been taken into the body. To cover acrimony a considerable degree of viscidity is also necessary; and when it is such as can be diluted with water, this greatly diminishes its power, and renders it almost useless. In fact, few demulcent remedies can be long in the stomach, or in passing through the intestines and other passages into the blood-vessels, without suffering a dilution fatal to their intention.

It is further probable, that demulcents, which are commonly of a nutritious kind, undergo such a change in the stomach, as to render them equally thin with the other aqueous fluids of the body. The mucilages and saccharine matters are, at least, so very easily dissolved as to afford this conclusion, that such substances can have no effect as demulcents, in the mass of blood, or in passing by the various excretions. With respect to the oily demulcents, the matter, indeed, is not so obvious; but considering what has been said, of the diffusion, and even mixture, of oil in our fluids, it will be probable that no material quantity of it can be present in the mass of blood, so as to act as a demulcent, or, *in their oily state*, to pass off by the excretions. Oil, indeed, is a matter fitted to inviscate the vegetable acid taken into the body; but by that very mixture the form of the oil is changed, and loses its tenacity. Another argument, however, may be employed in favour of oil, as a demulcent. It has been observed, that when an acrimony, in consequence of certain diseases, prevails in the mass of blood, an absorption of the oil which has been formerly laid up in the adipose membrane, takes place; and, Dr. Cullen says, it is with great probability supposed, that nature thereby intends, that the absorbed oil should cover the prevailing acrimony; and this supposition presumes, that the oil is fitted for this purpose. All this, he thinks probable; but that it will apply to show that oil taken in by the mouth will act as a demulcent, is to him very doubtful. In the other case of absorption, there may be circumstances, both in the nature of the acrimony prevailing, and in the state of the oil absorbed, which we do not know with any exactness.

In conclusion, Dr. Cullen says, "the oil commonly present in the blood, or even copiously introduced, is not a demulcent with respect to some acrimonies taken into the body. The vitriolic acid passes copiously by the skin in its acid state when it cures the itch; and the muriatic acid is found ready to irritate issues and open ulcers: and we might give other instances of acrid matters passing by various secretions in their acrid state, notwithstanding that a great deal of oil is at the same time taken in.

"From these considerations it seems probable, that the operation of demulcents, in covering acrimony in the mass of blood, must be very inconsiderable; and therefore, that they do not allay coughing by covering that acrimony, which, exhaling

from the lungs, and applied to the glottis, excites that uneasy motion. But it is certain, that the taking in of demulcents often allays coughing, and suspends the repetition of it for some time; and this, without having recourse to their operation in the mass of blood, may be accounted for in another way. As coughing is ordinarily excited by a halitus or vapour of some acrimony, arising from the lungs, and irritating the very sensible parts of the glottis and its neighbourhood; so, by besmearing these parts with a demulcent matter, we may often avoid the irritation we speak of, and, therefore, the frequency of coughing. Accordingly, medicines perfectly mild and free from acrimony, but of considerable viscidity, being swallowed leisurely, so that they may adhere to the fauces, answer these purposes."

The particular demulcents pointed out by Dr. Cullen, besides the *olea blanda*, are, the Asperifoliæ, *Symphitum*, and *Cynoglossum;* and of the Mucilaginosa, *Gum Arabic*, *Gum Tragacantha*, and *Isinglass*. See those articles.

DE'NS, (*quasi edens*; from *edo*, to eat, or from οδες, οδοντος); a tooth. Many herbs have this specific name, from their fancied resemblance to the tooth of some animal; as *dens leonis*, the dandelion; *dens canis*, dog's-tooth, &c.

DE'NS LEO'NIS. See Taraxacum.

DENSITY, that property in bodies, which is directly opposite to *rarity;* whereby they contain such a quantity of matter under such a bulk. Accordingly, a body is said to have double or triple the density of another body, when, their bulk being equal, the quantity of matter is, in the one, double or triple the quantity of matter in the other. The density of air, *cæteris paribus*, increases in proportion to the compressing powers. Hence the inferior air is denser than the superior; the density, however, of the lower air is not proportional to the weight of the atmosphere on account of heat and cold, and other causes perhaps, which make great alterations in density and rarity. However, from the elasticity of the air, its density must be always different at different heights from the earth's surface; for the lower parts being pressed by the weight of those above, will be made to accede nearer to each other, and the more so as the weight of the incumbent air is greater. Hence the density of the air is greater at the earth's surface, and decreases upwards in geometrical proportion to the altitudes taken in arithmetical progression. If the air be rendered denser, the weight of bodies in it is diminished; if rarer, increased; because bodies lose a greater part of their weight in denser than in rarer mediums. Hence, if the density of the air be sensibly altered, bodies equally heavy in a rarer air, if their specific gravities be considerably different, will lose their equilibrium in the denser, and the specifically heavier body will preponderate.

DENTA'RIA, (from *dens*, a tooth: so called, because its root is denticulated), or dentillaria; tooth-wort. This plant is to be distinguished from the pyrethrum pellitory of Spain, which is also called dentaria. It is the *Plumbago Europæa; foliis amplexicaulibus, lanceolatis scabris*, Linn. The root of this, prepared in a variety of ways, was formerly esteemed as a cure for the tooth-ach.

DENTA'TA. See Dentatus.

DENTA'TUS, (from *dens*, a tooth, from its tooth-like process), also named *dentata* and *epistrophœus;* the second vertebra of the neck. It differs from the other cervical vertebræ, in having a tooth-like process at the upper part of the body.

DE'NTES, the teeth. See Teeth.

DE'NTES LA'CTEI; the milk-teeth of infants. See Dentition and Teeth.

DENTICULA'TUS, in botany, a diminutive of *dentatus*.

DENTIFRICE, (*dentifricium;* from *dens*, a tooth, and *frico*, to rub); a remedy for the teeth. There are various kinds; generally made of earthy substances, finely powdered, and mixed with alum, or some other astringent substance. The common use of acids is pernicious, on account of their destroying the enamel of the teeth. Charcoal, in an impalpable powder, is the fashionable dentifrice at present. See Teeth.

DENTILLA'RIA, (from *dentella*, a little tooth, so called, because its root is denticulated). See Dentaria.

DENTITION (*dentitio:* from *dentio*, to breed teeth), the breeding or cutting of the teeth. It first takes place in infants, of six or seven months old; when the teeth are termed *primary*, or *milk-teeth*. About the seventh year, these are displaced by those called *secondary* or *perennial* teeth, which remain during life. The last dentition occurs between the ages of twenty and twenty-five, when the four last grinders appear, called *dentes sapientiæ*. The term *dentition*, however, is usually confined to the process of teething in infants.

Sauvages, in his system of Nosology, makes this a species of odontalgia. Dr. Cullen makes *dentitio*, synonymous with *odaxismos;* but does not admit it to be a disease. The usual symptoms produced in infants, are fretting; restlessness; frequent and sudden startings, especially in sleep; costiveness; and sometimes a violent diarrhœa, fever, or convulsions. In general, those children breed their teeth with the greatest ease who have a moderate laxity of the bowels, or a plentiful flow of saliva during that time.

In mild cases, we need only, when necessary, endeavour to promote the means by which nature is observed to carry on the business of dentition in the easiest manner. For this purpose, if a costiveness be threatened, it must be prevented, and the body kept always gently open; and the gums should be relaxed by rubbing them frequently with

the finger or with some softening remedy which will diminish the tension and pain. At the same time, as children about this period are generally disposed to chew whatever they get into their hands, they ought never to be without something that will yield a little to the pressure of their gums, as a crust of bread, a wax candle, a bit of liquorice-root, or such like; for the repeated muscular action, occasioned by the constant biting and gnawing at such a substance, will increase the discharge from the salivary glands, while the gums will be so forcibly pressed against the advancing teeth, as to make them break out much sooner, and with less uneasiness, than would otherwise happen. Some likewise recommend a slice of the thick rind of fresh bacon, as a proper masticatory for the child, in order to bring moisture into its mouth, and facilitate the eruption of the teeth by its elastic pressure on the gums. If these means, however, prove ineffectual, and bad symptoms begin to appear, the patient will often be relieved immediately by cutting the gum. It may be known that a tooth is near cutting, when the gum, in one particular part where the tooth or teeth may be expected to come, appears fuller and more distended than usual, and than the other parts of the gums are. The gum in that part looks red and inflamed at the bottom or base, but is paler or whiter at its point or edge; and when the tooth is very near cutting, the edge of the gum seems as if it had a flat white blister upon it, and appears thicker and broader than the edges of the gums are in other places. At this time, if any alarming symptoms come on, cutting the gum over the edge of the approaching tooth will be a speedy and often an effectual means of relief. Sometimes, in cutting the gums, though the symptoms abate, the tooth does not appear until some days, or perhaps weeks after; nay, sometimes the gum heals, and the former uneasy symptoms return; which, for their relief, require the cutting to be repeated, and that several times before the tooth will completely appear. It is a mistaken notion, that repeated cutting of the gum renders it harder: the contrary in fact happens, as Mr. John Hunter has shown in his Treatise on the teeth,

When the pulse is quick, the skin hot and dry, and the child of a sufficient age and strength, emptying the vessels by bleeding, especially at the jugular, will frequently be necessary in this, as well as in other inflammatory cases; gentle antimonial emetics, or calomel, may be given; or the belly may be opened, from time to time, by emollient clysters. But, on the contrary, if the child be low, sunk, and much weakened, repeated doses of a solution of the extract of bark, or some other strengthening medicine, ought to be prescribed. Blisters applied to the back, or behind the ears, will be often proper in both cases. A prudent administration of opiates, when their use is not forbid by costiveness or otherwise, is sometimes of great service in difficult teething, as, by mitigating pain, they have a tendency to prevent fever, convulsions, or other violent symptoms: often indeed they are absolutely necessary, along with the testaceous powders, for checking the immoderate diarrhœa which supervenes.

When cathartics are necessary, but the child seems too tender and weak to bear their immediate operation, they should be given to the nurse; in which case they will communicate so much of their virtues to the milk as will be sufficient to purge the infant. This at least certainly holds with regard to some cathartics; such, for example, as the infusion of senna, particularly if a very weak infusion be employed, and not used to such an extent as to operate as a purgative to the nurse.

DENTISCA'LPRA, an instrument for scaling the teeth; which, being applied near the gums, scrapes off the tartar that may have accumulated there.

DEOBSTRUE'NTIA, (from *deprio*, and *obstruo*, to obstruct), *deobstruents;* medicines that are exhibited with a view of removing any obstruction.

DEPHLEGMATION. Vinous spirits are said to be dephlegmated or rectified, when well freed from their watery parts, as by distillation.

DEPI'LATORY, (*depilatoria;* from *de*, of, and *pilus*, the hair); any application which removes the hairs from any part of the body. Thus a pitch-cap pulls the hairs of the head out by the roots; as is sometimes absurdly done in cases of *tinea.* Some advertised nostrums are called by the name of *Depilatories.*

DEPRESSION, (*depressio*, from *deprimo*, to press down) in surgery, a sinking inwards of some part of the skull, in consequence of external violence by which the bone is fractured. See COMPRESSION.

DEPRESSO'RES, (from *deprimo*, to press down). Several muscles are termed depressors, because they press down the parts into which they are inserted.

DEPRE'SSOR A'LÆ NA'SI. See DEPRESSOR LABII SUPERIORIS ALÆQUE NASI.

DEPRE'SSOR A'NGULI O'RIS, the *Triangularis* of Winslow, and *Depressor labiorum communis* of Douglas; a muscle of the mouth and lip, situated below the under lip. It arises, broad and fleshy, from the lower edge of the lower jaw, near the chin; and is inserted into the angle of the mouth, which it pulls downwards.

DEPRE'SSOR LA'BII SUPERIO'RIS ALÆQUE NA'SI, the *Depressor alæ nasi* of Albinus, *Incisivus medius* of Winslow, and *Depressor labii superioris proprius* of Douglas. It is a muscle of the mouth and lip, situated above the mouth. It draws the upper lip, and ala nasi, downwards and back-

wards. It arises, thin and fleshy, from the superior maxillary bone, immediately above the joining of the gums, with the two incisor teeth and cuspidatus: from thence it runs upwards, and is inserted into the upper lip and root of the ala nasi.

DEPRE'SSOR LABII INFERIORIS, the *Quadratus* of Winslow, and *Depressor labii inferioris proprius* of Douglas; a muscle of the mouth and lip, which pulls the under lip, and skin of the side of the chin, downwards, and a little outwards.

DEPRE'SSOR LABII SUPERIORIS PROPRIUS. See Depressor labii superioris alæque nasi.

DEPRE'SSOR LABIORUM COMMUNIS. See Depressor anguli oris.

DEPRE'SSOR O'CULI. See Rectus inferior oculi.

DEPRESSO'RIUM, an instrument formerly used for depressing the dura mater after the operation of the trepan.

DEPURATION, the freeing any liquid or solid body from its foulness, which may be effectedin various ways. 1. By *Decantation*, by which, when the grosser parts are settled at the bottom of the vessel, the clear liquor above is poured off. 2. *Despumation*, (see Despumation); in which eggs or other viscid matters are used. 3. *Filtration*, which is by passing, without pressure, the fluid to be purified, through strainers of linen, flannel, or paper, which, retaining the feculence, permit only the clear liquor to pass.

DERIVATION, the drawing away any inflammation or humour, that threatens any noble part, so as to fix it on some other, where there is not so much danger; as, in defluxions upon the eyes, to apply a blister to a neighbouring part. Such a translation of the disease sometimes also proceeds from natural causes. The doctrine of *derivation and revulsion*, talked of by the ancients, is, in their sense of these terms, wholly exploded. By revulsion they meant the driving back of the fluids from one part to another. The only rational meaning of the word *revulsion*, as here applied, is, the preventing too great an afflux of humours to any part, either by contracting the area of the vessels, or diminishing the quantity of what flows from them. Thus, any medicines promoting the secretions, may be said to make a revulsion, and, in this sense *derivation* can only be understood.

DE'RMA, (Δερμα, *the skin*). See Skin.

DERMATOI'DES, (Δερματοειδες; from δερμα, the *skin*, or *leather*, and ειδος, *likeness*). See Dura mater.

DERMATOLO'GIA, (δερματολογια; from δερμα, *the true skin*, and λογος, *a discourse*); a treatise upon the skin.

DERMATO-PATHOLO'GIA, (from δερμα, *the skin*, and παθολογια, *the pathology*); a treatise on the diseases of the cutis.

DESCE'NSUS, (from *descendo*, to move downwards). The old Chemists called it a distillation *per descensum*, by descent, when the fire was applied at top, and round the vessel, whilst the discharging orifice was situated at the bottom.

DESICCATIVE, (from *desicco*, to draw away or dry up), medicines used to dry up, or skin over, old sores. The old chemists also applied this term to calcination.

DESPUMATION, (*despumatio*; from *despumo*, to clarify); the clarifying of any liquor, by raising up its foulness in a froth, and removing it. This is generally practised on thick and clammy liquors, which contain much slimy and other impurities, not easily separable by filtration. The scum rises either by simply heating the liquor, or by *clarifying* it, which is done by mixing with the liquor, when cold, whites of eggs well beaten with a little water, which on being heated coagulates, and entangling the impurities of the liquor, rises with them to the surface, and may be easily removed by a perforated ladle. Or the liquor may now be filtered with ease. Spirituous liquors are clarified by means of isinglass dissolved in water, or any albuminous fluid, such as milk, which coagulates by the action of alcohol without the assistance of heat. Some expressed juices, such as those of the antiscorbutic plants, are instantly clarified by the addition of vegetable acid, such as the juice of bitter oranges.

DESQUAMATION, (*desquamatio*; from *desquamo*, to scale off); the falling off of the cuticle or scarf-skin, in the form of small scales.

DETERGE'NTIA, (*sc. medicamenta*; from *detergo*, to wipe off), *detergents*. Those applications are so termed by surgeons, which possess the property of cleansing foul ulcers. Such are terebinthinate applications, *oxymel æruginis*, &c.

DETERMINATION, the same as derivation. Fluids which accumulate in a diseased part are said to be *determined* thither in consequence of local stimulus. In apoplexy, we speak of *a determination* of blood to the head, &c.

DETONATION, in chemistry, an explosion with noise, made by the inflammation of a combustible body. Nitre, and some other mixtures into which that substance enters, are liable to detonation when heated in open or close vessels. Decrepitation differs from detonation only as producing a fainter noise, or merely a kind of crackling sound, peculiar to certain salts, which, from a state of solution, are crystallized so rapidly, that the crystals formed, burst into minute pieces. Fulmination is a more quick and lively detonation; such as takes place with fulminating gold, or fulminating powder, and in the combustion of inflammable gas, oxygen gas, and some other substances of the same kind.

DETRA'HENS QUADRA'TUS. See Platysma myoides.

DETRU'SOR URI'NÆ; the old name for the muscular coat of the urinary bladder.

DEVIL'S DUNG, a vulgar name for Assafœtida. See ASSAFŒTIDA.

DI'A, (διὰ, in Greek, signifying *ex* or *cum*, *of* or *with)*, is frequently prefixed to the names of some medicines formerly in use, as indicating the principal ingredient: thus, *Diascordium* is a composition wherein *Scordium* is the chief ingredient; *Diasenna*, from *Senna*, and so of many others.

DIABE'TES, (of διαβαινω, *to pass off*, or *through*), the *Diarrhœa urinosa*, *Diarrhœa ex oure*, *Dipsacos Hydrops ad matulam*, *and Profluvium urinæ* of ancient writers, and *Diuresis* of Vogel; a profuse discharge of crude unanimalised urine. Dr. Cullen places this genus of disease in the Class *Neuroses* and Order *Spasmi*. He defines it "a chronic profusion of urine, for the most part preternatural, made in immoderate quantity." The numerous species described by other nosologists he includes in these two: 1. *Diabetes mellitus*, comprehending the *Anglicus* of Sauvages, Mead, and others; and the *febricosus* of Sydenham. 2. *Diabetes insipidus;* which is the *Diabetes legitimus*, *Diabetes ex vino*, *Diabetes hystericus*, *arthriticus*, *artificialis*, &c. of other writers.

This disease first shows itself by a dryness of the mouth, thirst, white frothy spittle, and the urine in somewhat larger quantity than usual. A heat begins to be perceived in the bowels, which at first is a little pungent, and gradually increases. The thirst continues to augment by degrees, and the patient gradually loses the power of retaining his urine for any length of time. In Dr. Home's Clinical Experiments we have an account of two patients labouring under this disease: one of them drank between ten and twelve English pints a-day without being satisfied. The quantity taken was greater in the forenoon than in the afternoon. In the other the case was reversed : he drank about four pints a-day, and more in the afternoon than the forenoon. The former passed from twelve to fifteen pints of urine in the day ; the latter eleven or twelve; so that his urine always exceeded his drink by eight or at least seven pints. When the urine is retained a little while, there is a swelling in the loins, ilia, and testes. In this disease the strength gradually decays; the skin is dry and shrivelled; œdematous swellings arise in various parts of the body, but afterwards subside without relieving the disease in the least; and the patient is frequently carried off by convulsions.

The most singular phenomenon, in that species of the disease termed *mellitus*, is, that the urine seems to be entirely, or very much, divested of an animal nature, and to be largely impregnated with a saccharine salt scarcely distinguishable from that obtained from the sugar-cane. This discovery, first made by Willis, was laboriously investigated by Dr. Dobson, of Liverpool. By the latter some experiments were made on the urine of a person labouring under a diabetes, who discharged twenty-eight pints of urine every day, taking, during the same time, from twelve to fourteen pounds of solid and liquid food: Some of this urine being set aside, fell into a spontaneous effervescence, changed first into a vinous liquor, and afterwards into an acetous one, before it became putrid and offensive. Eight ounces of blood taken from the same patient, separated into crassamentum and serum; the latter being sweet to the taste, but less so than the urine. Two quarts of the urine, evaporated to dryness, left a white cake weighing four ounces two drachms and two scruples. This cake was granulated, and broke easily between the fingers: it smelled sweet like brown sugar; neither could it by the taste be distinguished from sugar, except that it left a slight sense of coolness on the tongue. The experiment was repeated after the patient was recovered to such a degree as to pass only fourteen pints of urine a-day. There was now a strong urinous smell during the evaporation; and the residuum could not be procured in a solid form, but was blackish, and much resembled very thick treacle. In Dr. Home's patients, the serum of the blood had no preternatural sweetness; in one of them the crassamentum was covered with a thick inflammatory crust. In one of these patients the urine yielded an ounce and a half, and in the other an ounce, of saccharine matter from each pound. It had, however, an urinous smell, and a saline taste mixed with the sweet one; and the urine of one, fermented, with yeast, we are told, into "tolerable small beer." In both these patients, it should seem, there existed symptoms characteristic of each species of diabetes. Both had voracious appetites, and a perpetual gnawing sense of hunger; as had also Dr. Dobson's patient. Indeed the urine of those affected with the insipid diabetes has not been examined with sufficient accuracy to enable us to speak with confidence of its contents.

The causes of Diabetes are exceedingly obscure and uncertain: spasmodic affection of the nervous system, debility, and every thing inducing it, but especially strong diuretics and immoderate venery, have been accused of bringing on this disease. Both species, however, have occured in persons where none of all these causes could be suspected; nor have the best physicians been able to determine it. Dissections have only shewn that the kidneys were in an enlarged and lax state. In one of Dr. Home's patients who died, they smelled sour; which affords a presumption, that the sweet urine peculiar to diabetes mellitus, came from the kidneys, and was not sent directly from the intestines by a retrograde motion of the lymphatics, as Dr. Darwin and others have imagined.

If we are to believe, that, in either species of this affection, the morbid secretion of urine, whether preternatural in point of quantity or quality,

arises from a diminution of tone in the kidney, the great object in the cure seems to be, the restoration of due tone to the secreting vessels of that organ. But as even this diminished tone could not give rise to the peculiar vitiated secretion without a morbid action of the stomach or other parts concerned in nutrition, it is necessarily a second object to remove this morbid sensibility. On these grounds, but without a due discrimination of the different species of the disease, practitioners have rested their hopes of a cure almost wholly on the exhibition of astringent and strengthening medicines. Dr. Dobson's patient was relieved by the following remedies; which, however, were frequently varied, as none of them produced good effects for any length of time: the bark in substance, with small doses of rhubarb; decoction of the bark, with the diluted acid of vitriol; a cold infusion of the bark, of which he drank from a quart to two quarts daily; Dover's powder; alum-whey; lime-water; antimonials combined with *tinctura opii.* The warm bath was used, occasionally, when the skin was remarkably hot and dry, and the patient complained of restlessness and anxiety. Tincture of cantharides was likewise tried; but he could never take more than twenty-five drops for a dose, without perceiving great uneasiness in his bowels. The body was kept constantly open, either with rhubarb or the infusion of senna joined with rhubarb. His common drinks were rice-water; lime-water, alone, or with milk; sage, balm, or mint-tea; small-beer, simple water, and water acidulated with the vitriolic acid. In seven months these remedies, in whatever manner varied, made no further progress in removing the disease. In Dr. Home's patients, all these medicines, and many others, were tried without the least good effect; insomuch that he uses this remarkable expression: "Thus, these two patients have exhausted all that experience had ever recommended, and almost all that theory could suggest; yet, in both cases, the disease has resisted all the means of cure used." It is remarkable, that though the septics were given to both, in such quantity as evidently to produce a putrescency in the *primæ viæ*, the urine remained unaltered both in quantity and quality.

Although this disease be frequently in its nature so obstinate as to resist every mode of cure, yet there can be no doubt that particular remedies have succeeded in different cases. Dr. Brisbane relates several cases cured by the use of tincture of cantharides; and Dr. M'Cormick has related some in the 9th volume of the Edinburgh Medical Commentaries, which yielded to Dover's powder after a variety of other remedies had been tried in vain.

But an improvement of great magnitude has of late been suggested by Dr. Rollo, surgeon-general of the Royal Artillery, who in a treatise on the *Diabetes mellitus*, worthy the perusal of every medical man, recommends a *total abstinence from vegetable food*, together with the exhibition of such remedies as counteract the formation of *saccharine matter* in the body, as the most rational system to be pursued. He considers as the proximate cause of diabetes mellitus, "a morbidly increased action of the stomach, with consequent secretion and vitiation of the gastric fluid, marked by an eagerness of appetite, and acidity. The direct effects of these are the formation and evolution of saccharine matter, with a certain defect of assimilation, preventing the healthy combinations, and exciting the immediate separation of the imperfectly formed chyle by the kidneys."—

"In the diabetic stomach," Dr. Rollo says, "vegetable matter does not seem to undergo any putrefactive change; but the change seems to be in the evolution of its saccharine matter, after which it does not go beyond the acid state." He thinks it possible, that more than the quantity of saccharine matter usually residing in vegetables, is furnished by a sugar-making process going on in the stomach. The morbid action of the latter is also strongly indicated by the voracious appetite commonly existing in this disease and by its frequent recurrence; nor can it, consequently, be doubted, that an increased secretion and morbid change take place in the gastric juice.

"The explanation of the increase in the quantity of the urine refers to the formation of saccharine matter principally;" but Dr. Rollo also supposes a sympathetic effect to be produced on the kidneys, from the increased action of the stomach. "A scarcity of urine," says he, "of a high colour, and offensive smell, when of some continuance, may denote the stomach of imperfect force; the common healthy quantity and usual appearance, the stomach in perfect force; and a great proportion of urine, the stomach of too much force, or the stomach under morbidly irritable action.

"The *increased quantity of urine* has been supposed connected with a state of skin favouring absorption from its surface. The lungs have also been imagined to form an extraordinary quantity of water, which was reabsorbed. However, *neither the one or the other is necessary;* as we have hitherto *found the quantity of urine to correspond with the quantity of fluid actually drank.* But should it be ascertained, that there is really a greater quantity of urine discharged than of fluids taken in, and that this continued some time without any farther diminution of the weight of the body, it would become necesssary to enquire, in what manner such an increase of urine was maintained.

"The great quantity of extractive matter, exclusive of the saccharine substance, shows some defect in the powers of assimilation; but as the nature of these are not understood, we cannot attempt any particular explanation. Such defect, however, may

be said to depend on the state of the stomach producing the disease, with, probably, some morbid activity of the lacteal absorbents." These opinions are supported by various well-attested facts, and by some very judicious and accurate chemical experiments, instituted by Mr. Cruikshank and the author, which last exhibited the following results: "1. That sugar consists of carbon, hydrogen, and oxygen; and may be considered as a pure vegetable oxyd; 2. That sugar of milk is composed of the same principle, but contains more oxygen, and considerably less charcoal; 3. That gum differs from sugar, in containing, besides carbon, hydrogen, and oxygen, both lime and azot; 4. That vegetable farina cannot be converted into saccharine matter, without the joint action of oxygen and water, the first of which appears to be absorbed, and the last decomposed during this process; 5. That when sugar is deprived of its oxygen, or combined with other substances, it loses its characteristic properties, and is no longer susceptible of the vinous fermentation; 6. That neither vegetable nor animal mucilages, in their pure state, are susceptible of this process."

The methods of cure which have been founded, and with an extraordinary degree of success, on the foregoing principles, we have already stated. On these, the propriety of the different medicines which Dr. Rollo recommends to be employed in diabetes mellitus, must be obvious; more particularly the pure alkalies, lime-water, and the different sulphurets, all of which counteract the formation of saccharine matter in the stomach, particularly the sulphuret of potass.—We also readily see the necessity of a diet, consisting entirely of animal food; being the only one which does not furnish oxygen, and that peculiar but simple combination of carbon and hydrogen, constituting the basis of sugar, and without which it cannot be produced.

"When the urine points out the absence of the saccharine matter, and at the same time its quantity continues more than natural, containing likewise more of the extractive matter in a viscid or tenacious form, while the appetite remains keen, it may be presumed that the increased morbid action of the stomach is not removed. It becomes then necessary to exhibit the *hepatised ammonia*, with an opiate and antimonial at night, and to continue them until the morbid condition of the stomach is removed; the marks of which are, a scarcity and high coloured state of the urine, with turbidness; furnishing, on evaporation, an offensively smelling, and saltish tasted residuum, without tenacity, accompanied with a want of appetite, and loathing of food. At this time the tongue and gums will be found to have lost their florid colour, and to have become pallid."

When such a state occurs, Dr. Rollo says, exercise should be used, and bread gradually allowed, with such vegetables and drinks as are least likely to furnish saccharine matter, or to become acid in the stomach; for without these, a disposition to scurvy might perhaps take place.

Mr. Cruikshank prepared the hepatised ammonia by passing hepatic gas through the *Aq. ammon. pur.* (Phar. Lond.) The dose, five or six drops three or four times a-day, is to be *very cautiously augmented*, till a giddiness is produced.

In p. 391 of Dr. Rollo's cases, the common error as to the increase of urine beyond the quantity of fluids drunk, is corrected; and in this the experiments of Dr. Lubbock, a subsequent writer on the Diabetes Mellitus, coincide. So little, indeed, is the *quantity* of urine concerned in this species, that Dr. Rollo rather thinks the disease entitled to a different name; some cases having come within his knowledge, in which the urine was far from redundant in quantity, whilst its quality was abundantly characteristic of its true nature.

The treatment of the second species of diabetes is exceedingly uncertain, as might be expected from our imperfect knowledge of its causes. The remedies which have been tried in the cases cited above, and others on record, will of course be resorted to. Dr. Rollo has succeeded in the use of some of these, but more particularly recommends mercury and the nitric acid as in syphilis. See SYPHILIS. With regard to those species of the diabetes which are symptomatic, as the *hystericus*, *arthriticus*, &c. their treatment manifestly depends on the removal of the primary affection.

DIABO'TANUM, (from δια, and βοτανη, *an herb)*; the name of a plaster prepared of herbs.

DIA'CHYLON, in pharmacy, a well known plaster, composed of a solution of litharge in olive oil. To this the college have lately given the name of *Emplastrum lithargyri*. The properties of this plaster are very generally known. See LITHARGYRUS.

DIACO'DIUM, (διακωδιων, from δια and κωδια, or κοδεια, *a poppy head)*. *Codia* signifies the top or head of any plant, but by way of eminence particularly the poppy. It is a name for the syrup made with the heads of white poppies.

DIADE'LPHIA, (from δις, *twice*, and αδελφος, *a brother)*, the seventeenth class in the sexual system of botany, comprehending those plants which bear hermaphrodite flowers with two sets of united stamina; but this circumstance must not be absolutely depended on. They are the *papilionacei* of Tournefort, the *irregulares tetrapetali* of Rivinus, and the *leguminosi* of Ray. See BOTANY.

DIADO'SIS, (διαδοσις, from διαδιδωμι, *to distribute* or *dissipate)*; a term used by some medicinal writers, signifying, to remit; though sometimes it means nutrition, or the distribution of the aliment all over the body.

DIÆ'RESIS, (διαιρεσις, from διαιρεω, *to divide* or *separate)*, denotes any solution of continuity; though, in surgery, it usually means, that species

of operation, by which parts morbidly or preternaturally united, are divided.

DIAGNO'SIS, (διαγνωσις; from διαγνωσκω, *to discern* or *distinguish)*; the science which delivers the signs by which one disease may be distinguished from another disease: hence those symptoms which distinguish such affections are termed *diagnostics.*

DIA'LYSIS, (διαλυσις, from a διαλυω, *to dissolve)*; a dissolution of continuity, or destruction of parts. An order in the class *locales* of Cullen's Nosology is termed *Dialyses.*

DIAMOND, the hardest, heaviest, and most brilliant of the precious stones. It is a specimen of quartzose crystal. Diamonds are met with among the species of two different genera in the order of Quartz. Bergmann places the diamond amongst the inflammables; he observes, that when it is exposed to the fire in an open vessel, it is wholly consumed, burning with a lambent flame. This deflagration, though slow, shows decidedly its affinity to the inflammables: besides, in the focus of a burning glass, it leaves traces of soot.

DIA'NDRIA, (from δις, *twice*, and ανηρ, *a husband*), in the Linnæan system of botany, a class of plants the second in order, comprehending all those with hermaphrodite flowers, and only two stamina in each. It includes three orders. See Botany.

DIA'NTHUS CARYOPHY'LLUS; the systematic name of the clove-pink. See Caryophyllum rubrum.

DIAPEDE'SIS, (διαπεδησις; from δια, *per*, through, and πηδαω, *salio*, to leap); such a rupture of the sides of a vessel of the body, from an internal cause, as leaves considerable interstices between the fibres, through which the contents escape. It is also expressive of a transudation of blood through the coats of an artery.

DIAPE'NTE, (πεντε, *five*), an ancient composition, so called because it consisted of five ingredients.

DIA'PHANOUS, (Διαφανυς; from δια, *through*, and φαινω, *to shine)*; a term applied to any substance which is transparent; as the hyaloid membrane covering the vitreous humour of the eye, which is more transparent than glass.

DIAPHORE'SIS, (διαφορησις; from διαφορεω, *to carry through)*; perspiration, or an increase of the cutaneous secretion. See Perspiration.

DIAPHORE'TICA, (διαφορητικα; from διαφορεω, *to carry through)*, *diaphoretics*; medicines which, being taken internally, increase the discharge of perspiration by the skin. This class of medicines, according to Dr. Hooper, comprehends five orders: 1. *Pungent diaphoretics*, as the *volatile salts* and *essential oils*, which are well adapted for the aged; those in whose system there is little sensibility; those who are difficultly affected by other diaphoretics; and those whose stomachs will not bear large doses of medicine. 2. *Calefacient diaphoretics*, such as *serpentaria*, *contrayerva*, and *guaiacum*: these are given in cases where the circulation is low and languid. 3. *Stimulant diaphoretics*, as antimonial and mercurial preparations, which are best fitted for the vigorous and plethoric. 4. *Antispasmodic diaphoretics*, as *opium*, *musk*, and *camphor*, which are given to produce a diaphoresis, when the momentum of the blood is increased. 5. *Diluent diaphoretics*, as water, whey, &c. which are best calculated for that habit, in which a predisposition to sweating is wanted; and in which no diaphoresis takes place, although there be evident causes to produce it.

All diaphoretics operate either by exciting the force of the circulation, or by exciting the action of the extreme vessels on the surface of the body only; and these two operations take place sometimes separately and sometimes together. An unnecessary and vague distinction has been made between diaphoretics and sudorifics, which, in fact, mean the same remedies, operating only in different degrees, so as to produce *sensible*, or *insensible*, perspiration. Dr. Cullen, for this reason, considers both under the head of *diaphoretica.*

With respect to the operation of this class of remedies, as the water of the blood passes out by urine or perspiration, so the quantity of these excretions will be in proportion to the quantity of water present in the mass of blood; and the passing of it by the one excretion or the other will be determined by certain circumstances of the animal economy, which merit our consideration.

The general force of the circulation, and the activity of the extreme vessels, are what determine to, and support, both sensible and insensible perspiration. The activity of the extreme vessels, may depend upon the heat of the air applied to the surface of the body, or upon cold applied, whilst the circulation is kept, by exercise or other causes, in a vigorous state. The determination to the kidneys seems to depend upon the saline state of the fluids fitted to pass by that secretion; whilst the situation of the kidneys is fitted for a copious secretion of the watery parts of the blood. Whether there are any parts of the mass of blood which, without exciting the general circulation, are particularly fitted to pass by the skin, is not easy to determine; but Dr. Cullen is disposed to think there are none such, as the function of perspiration does not appear to be a glandular secretion, but merely an exhalation.

The action of the exhalant vessels may be excited by heat, friction, and stimulant substances, applied externally; but it is difficult to conceive that any medicine, without affecting the general circulation, can be conveyed to the extreme vessels, so as to act on these only, or so universally on these, as is required in the production of sweat. "It would appear then, that there are no *diaphoretics* strictly to be so called, that is, internal medicines

acting upon the organs of perspiration alone; and if the action of the extreme vessels is excited without any increased action of the general powers of circulation, it must be by medicines acting upon certain parts of the system, which, by a *consent of nerves*, can excite the action of these extreme vessels. When we therefore speak of particular diaphoretics, we necessarily speak of all of them under the idea of their being sudorifics, whether acting upon the general circulation, or upon the extreme vessels only.

But it is necessary, by the way, to observe, that under the most powerful determination to the skin, we find the mere application of heat, without any assistance from internal medicines, sufficient to produce sweating; and that external cold applied, can almost certainly prevent the same, though considerable powers are employed from within. The application of heat therefore to the surface of the body, and the avoiding of external cold, are circumstances almost absolutely necessary to favour the operation of sudorifics. These ends may be obtained: 1. By the heat of the air applied, as in what is called the dry bagnio. 2. By increasing the heat of the surface by previous warm bathing. 3. By accumulating the warm effluvia of the body itself upon its surface. This last may be done by wrapping the body very closely in such coverings as both prevent the escape of its own effluvia, and at the same time prevent the access of external cold. A robe of oiled silk, covered, or lined, with flannel, is perhaps the best for this purpose.

To favour the operation of sudorifics, another means is commonly used, which is, the taking of a quantity of some warm liquid; which not only excites the general circulation, but particularly, by the consent of the vessels on the surface of the body with the stomach, excites the action of those vessels which pour out sweat.

With regard to the general effects of diaphoretics upon the system, Dr. Cullen says, that as their operation often depends upon their promoting the action of the heart and arteries, and thereby exciting the impetus of the blood in every part of the system; so they may be useful in all cases in which the circulation is languid, and when the powers of it are inert. However, the application of it to particular diseases is somewhat uncertain, for it is difficult to determine in what circumstances the practice may be safe. The languor of the circulation may be owing to the diminished energy of the brain, from causes acting especially in the organ itself; and in what cases the increased action of the heart and arteries will remove these causes, and restore the energy of the brain, is very uncertain. For example, it is difficult to say in what cases of apoplexy and palsy the action of the vessels may be safely increased: Dr. Cullen indeed is persuaded, that it can be safely done in very few instances.

"When," says he, "the effects of the diminished energy of the brain appear, especially in the state of the circulation, the applying of a stimulus to the heart and arteries may seem to be more safe and proper; but it is difficult to give the due measure to such a stimulus, so as to render it both safe and durable; and we commonly find that tonics and exercise are both safer, and at the same time more effectual. In that general loss of tone which we call a *cachexia*, tonics, rather than stimulants, are found to be necessary.

"When there are any fixed obstructions in any part of the system, it is difficult to determine when the increased impetus of the circulation is capable of overcoming and removing them; and much random judgment has been produced on this subject, while it is very evident, that when such increased impetus is not capable of overcoming the obstruction, it is likely to prove very hurtful.

"When it happens that the action of the heart and arteries is already considerably increased, it will be readily supposed, that medicines which increase the same would be improper; and so far as they operate only by increasing the action of the heart and arteries, they may certainly be hurtful: but as nature has intended, that the effects of the increased impetus of the blood should be obviated by the flowing of sweat; so, when the operation of sudorifics, especially of those acting upon the extreme vessels alone, produces this effect, it is possible that this sweating may not only render the first operation of sudorifics safe, even in cases where the impetus of the blood was before preternaturally increased, but may also prove a means of removing the causes of that preternatual increase, and prove a remedy for the disease."

In fevers, sweating, any how excited, may sometimes do good; but it is at the same time extremely doubtful, whether it be desirable when excited by medicines acting upon the heart and arteries: indeed it is known that such medicines are generally hurtful. When the diaphoresis, however, has been superinduced by medicines which act upon the extreme vessels only, as these tend to remove the spasm of the extreme vessels, which constitutes the disease, they may produce a cure. Sweating, by such means, Dr. Cullen thinks, may in most cases be employed.

In phlegmasiæ, the Dr. says, there is more difficulty in determining the propriety of sweating. By heating medicines, it is certainly improper; but by those which act upon the extreme vessels alone, it may possibly be allowed. However, it has been found, that sweating, even by the most simple means, has aggravated inflammatory diseases, so that it is at least to be employed with great caution. The effects of *Dover's powder* in rheumatism, show, it is true, that sweating is not only compatible with, but may prove a remedy in, a very inflammatory

state of the system; yet the circumstances of the particular phlegmasiæ that allow or forbid this practice, are by no means sufficiently ascertained.

Diaphoretics may be, and generally are supposed, proper in diseases of the skin; but the distinctions and pathology of cutaneous affections are involved in too much obscurity, to admit of any precision on that subject. On the supposition that certain acrimonies, diffused over the whole system, may be expelled by sweating, very powerful sudorifics have been resorted to, as a means of curing the lues venerea, and it is alleged that they have actually proved successful. It has been supposed that sweating, like other serous evacuations, may occasion an absorption of serum from the cavities in which it has been accumulated, in the various species of dropsy: and, in some instances, this seems to have happened; but it does not happen so readily and constantly as to render the practice preferable to the other practices which may be employed for the same purpose.

For a list of the particular diaphoretics, see the article MEDICINES.

DIAPHRAGM, (διαφραγμα, from διαφρασσω, *sepio*, or *munio*, to hedge, or wall in); also called *Septum Transversum;* a broad thin muscle, which forms a complete septum between the thorax and abdomen. It is concave below, and convex above; the middle of it on each side reaching as high within the thorax as the fourth rib. It is commonly divided, by anatomists, into two portions, *viz.*

1. The *superior* or greater muscle which arises, by distinct fleshy fibres, from the cartilago ensiformis, from the cartilages of the seventh, and of all the inferior ribs on both sides. The fibres from the cartilago ensiformis, and from the seventh and eighth ribs, run obliquely upwards and backwards; from the ninth and tenth, transversely inwards and upwards; and from the eleventh and twelfth, obliquely upwards. From these different origins the fibres run, like radii, from the circumference to the centre of a circle; and are inserted into a cordiform tendon, of a considerable breadth, which is situated in the middle of the diaphragm, and in which, therefore, the fibres from opposite sides are interlaced. Towards the right side the tendon is perforated, by a triangular hole, for the passage of the vena cava inferior; and to the upper convex part of it the pericardium and mediastinum are connected.

2. The *inferior*, lesser muscle, or appendix of the diaphragm. This arises from the second, third, and fourth lumbar vertebræ, by eight heads; of which two in the middle, commonly called its *crura*, are the longest, and begin tendinous. Between the crura, the aorta and thoracic duct pass; and, on the outside of these, the great sympathetic nerves and branches of the vena azygos perforate the short-heads. The muscular fibres run obliquely upwards and forwards, and form, in the middle, two fleshy columns, which decussate, and leave an oval space between them for the passage of the œsophagus and eighth pair of nerves. This muscle is inserted, by strong fleshy fibres, into the posterior part of the middle tendon.

The diaphragm is the principal agent in respiration, particularly in inspiration (see RESPIRATION): for when it is in action, the fibres, from their different attachments, endeavour to bring themselves into a plane towards the middle tendon, by which the cavity of the thorax is enlarged, particularly at the sides, where the lungs are chiefly situated; and as the lungs must always be contiguous to the inside of the thorax and upper side of the diaphragm, the air rushes into them, in order to fill up the increased space. This muscle is assisted by the two rows of intercostals, which elevate the ribs, and the cavity of the thorax is more enlarged. In time of violent exercise, or whatever cause drives the blood with unusual celerity towards the lungs, the pectoral muscles, the serrati antici majores, the serrati postici superiores, and scaleni muscles, are brought into action. And in laborious inspiration, the muscles which arise from the upper part of the thorax, when the parts into which they are inserted are fixed, likewise assist. In exspiration, the diaphragm is relaxed and pushed up, by the pressure of the abdominal muscles, upon the viscera of the abdomen; and at the same time that they press it upwards, they also, together with the sterno-costales and serrati postici inferiores, pull down the ribs, and are assisted in a powerful manner by the elasticity of the cartilages that join the ribs to the sternum; by which the cavity of the thorax is diminished, and the air suddenly rushes out of the lungs; and, in laborious exspiration, the *quadrati lumborum*, *sacro lumbales*, and *longissmi dorsi*, concur in pulling down the ribs.

DIAPHRA'GMITIS, (διαφραγμιτις; from διαφραγμα, *the diaphragm*), the same as *Paraphrenitis;* an inflammation of the diaphragm. See PARAPHRENITIS.

DIAPYE'SIS, (διαπυησις), in Sauvage's nosology, a kind of abscess in the eye, causing blindness.

DIARRHŒ'A, (διαρροια; from διαρρεω, *to flow through*); a purging, or laxity of the bowels. It is distinguished by frequent stools with the natural excrement, not contagious, and seldom attended with pyrexia. It is a genus of disease in the class *neuroses*, and order *spasmi* of Dr. Cullen, containing the following species: 1. *Diarrhœa crapulosa;* the feculent diarrhœa, so named from *crapulus*, which signifies one who overloads his stomach. 3. *Diarrhœa biliosa;* the diarrhœa from an increased secretion of bile. *Diarrhœa mucosa;* the mucous diarrhœa, from a quantity of slime being voided. 4. *Diarrhœa hepatica;* the hepatic, in which there is a quantity of serous matter, somewhat resembling flesh, voided;

the liver being primarily affected. 5. *Diarrhœa lienterica*, the lientery; when the food passes the bowels unchanged. 6. *Diarrhœa cœliaca;* the cæliac passion (see CŒLIACA PASSIO), in which the food passes in a milky state like chyle. 7. *Diarrhœa verminosa;* or that arising from worms. Many of these distinctions are imaginary, or at all events, of little practical utility; for which reason, we shall confine our remarks to the first species.

This kind of diarrhœa, besides the matters usually excreted, is attended with a copious dejection of the mucus of the intestines, with great pain; while the patient daily pines away, but without having fever. Persons of all ages are liable to it, and it comes on usually in the winter-time; but is so obstinate that it will sometimes continue for years. In obstinate loosenesses of this kind, vomits frequently repeated are of the greatest service, and afterwards small doses (a grain or two) of ipecacuanha. It is also very beneficial to keep the body warm, and to rub the belly with stimulating ointments; at the same time that astringent clysters, rhubarb, and stomachic medicines, are to be exhibited. Starch clysters are very often of service. Some kinds of looseness are contagious; and Sir John Pringle mentions a soldier who laboured under an obstinate diarrhœa, who infected all those who used the same privy with himself. In a looseness which frequently followed a dysentery, the same author tells us that he began the cure by giving a vomit of ipecacuanha, after which he put the patients on a course of astringents. He used the following:

℞ Extr. ligni Campechen. ʒiij. Solve in
Sp. cinnam. ℥iss. Adde,
Tinct. catechu ʒij.
Aq. distillat. ℥vij. Fiat Mistura.

Of this the patient took two spoonfuls once in four or five hours, and sometimes also an opiate at bed-time. He recommends the same medicine in obstinate diarrhœas of all kinds. A decoction of *simarouba bark* (see SIMAROUBA) was also found effectual when the dysenteric symptoms were gone off. Dr. Huck, who used this remedy in North America, also recommends it in diarrhœas.

℞ Cort. Simaroub. ℥ij. ad ℥iij.
Coque in aq. font. lib. iss. ad lib. j.
Cola ut fiat decoctio.

The whole of this quantity was taken within the day. He began with the weakest decoction; and when the stomach of the patient could easily bear it, he then ordered the strongest: but at the same time he acknowledges, that unless the sick found themselves sensibly better within three days from the time they began the medicine, they seldom afterwards received any benefit from it. But when all astringents have failed, Sir John Pringle informs us, he has known a cure to be effected by a milk and farinaceous diet; and he thinks, in all cases, the disorder would be much more easily removed, if the patients could be prevailed upon to abstain entirely from spirituous liquors and animal food. If the milk by itself should turn sour on the stomach, a third part of lime-water may be added. In one case he found a patient receive more benefit from good butter-milk than from sweet milk. The proper drinks are decoctions of barley, rice, calcined hartshorn, toast and water, or milk and water.

Dr. Hugh Smith proposes to cure the diarrhœa in the following way. If the disease should be owing to acrid, putrid, or bilious sordes, it will be necessary to expel by the shortest method the irritating fomes. For this purpose, an emetic of ipecacuanha, and afterwards a purgative with rhubarb, will be expedient.

℞ Rhabarb in pulv. trit. gr. xij.
Pulv. aromatic. gr. iij.
Tinct. opii, gtt. xv.
Syr. e cort. aurant. q. s.
Fiat Bolus nocte hora decubitus sumendus.

Or,

℞ Tinct. rhabarb.
Aq. cinnam. aa ℥j.
Tinct. opii, gtt. xv. Misce fiat Haustus.

Or,

℞ Infus. sennæ, ℥ij.
Kali tartar. ʒiss.
Sal. corn. cerv. gr. viij.
Tinct. lavendulæ comp. ʒj. Misce, fiat Haustus.

When a purging succeeds to an obstructed perspiration, the flow of humours should be diverted from the intestines to the skin; the irritation abated, and the mouths of the vessels, which throw out their contents into the intestines, contracted and closed. Small doses of ipecacuanha given at bed-time, will tend to this; and medicines of the opiate, astringent kind, will allay the irritation, and prevent too great a secretion from the exhaling vessels.

℞ Pulv. rad. ipecacuanh. gr. ij. ad iv.
Pulv. aromatic. ℈ss.
Syr. cort. aurant. q. s. Misce.
Fiat Bolus, omni noct. hor. somni sumendus.

℞ Ligni Campechens. ras. ℥ij.
Coq. ex aq. fontan. q.s. ad colatur. lb. j. Adde,
Tinct. catechu, ℥j.
Tinct. opii, gtt. xxx.

Syr. cort. aurant. ℥ss. Misce.
Capiat coch. iv. quarta quaque hora, vel urgente Diarrhœa.

Or,

℞ Mist. cretac.
Aq. cinnam. aa ℥iv.
Elect. e scord. ʒiij.
M. capiat coch. iij. pro re nata.

In the *Chronic Diarrhœa*, or purging of long duration, the above method, especially if joined to exercise on horseback, will most frequently relieve. The ipecacuanha bolus above directed will greatly avail; and the rhubarb bolus will tend to strengthen the intestines and check the flux. When the purging is abated, the bark, well guarded with aromatics and opiates, will strengthen the habit, and prevent a relapse.

DIARTHRO'SIS, (διαρθρωσις, from δια, *per*, and αρθρον, *a joint*), that species of articulation which is moveable. The late Dr. William Hunter reckoned it to consist of three species. 1. The *Enarthrosis*, or *ball and socket;* when a large head is received into a deepish cavity. 2. *Arthrodia*, when a round head is received into a superficial cavity. These two kinds admit of a motion on all sides. 3. *Ginglymus*, when the parts of the bones mutually receive, and are received. This last kind of articulation only admits of flexion and extension.

DIASCO'RDIUM, so called from the scordium in it. It is now called *Electarium e Scordio*. See Dia.

DIA'STASIS, (διαςτασις, from διςτημι, *to separate*). This term is used by the old writers, to signify the distance betwixt the fractured ends of bones receding from each other; the interstice which is natural between the radius and the ulna; the distension of the muscles which happens in convulsions; an effort to vomit; and, by some, it is used to signify a luxation.

DIA'STOLE (διαςτολη, from δια, and ςτελλω, *to contract*, or *stretch)*, signifies the dilatation of the heart, auricles, and arteries; and stands opposed to the systole, or contraction of the same parts. See Artery and Heart.

DIA'STOMOTRIS (διαςτομωτρις); implies any dilating instrument, as a speculum oris, speculum ani, &c.

DIASTRE'MMA, (διαςτρημμα, from διαστρεφω, *to distort* or *turn aside)*; a distortion of the limbs.

DIA'TASIS, (διατασις, from διατεινω, *to distend*, or *stretch out)*; the extension of a fractured limb, in order to its reduction.

DIATE'SSARON, (from δια, and τεσσαρες, *four*), an ancient compound, so called because made of four ingredients.

DIA'THESIS, (διαθεσις from διατιθημι, *(to dispose)*: any particular state of the body: thus, in inflammatory fever, there is an inflammatory diathesis, and, during putrid fever, a putrid diathesis, &c.

DICRO'TIC, (from δις, *twice*, and κρεω, *to strike)*; an epithet applied to that state of the pulse, in which there is a kind of reiteration that conveys the idea of a double stroke. Dr. Heberden has given the following estimates of the pulse in the human subject, taken at a medium, in different periods of life:

	Pulsations.
In a new born infant, - -	130 to 140
During the 1st month, - -	120
1st year, - - -	108—120
2nd year, - -	90—100
3rd and 4th, -	
5th and 6th, -	80—108
7th and 8th, -	80— 86—72 rarely.
12th - - - - -	70— 75
In adults - - - - - - - - -	70

In extreme old age often - 50— 60: in irritable habits, however, often quicker than in adults.

DICTA'MNUS, (from a city of that name in Crete, on whose mountains it grows); dittany.

DICTA'MNUS ALBUS; white fraxinella, or bastard dittany. *Dictamnus albus; foliis pinnatis, caule simplici*, Linn. Class, *Decandria*. Order, *Monogynia*. The root, which is the part directed for medical use, when fresh, has a moderately strong, and not disagreeable, smell. Formerly it was much used as a stomachic and tonic remedy, but it is now fallen into neglect.

DICTA'MNUS CRE'TICUS, dittany of crete; the *Origanum dictamnus; foliis inferioribus tomentosis, spicis nutantibus*, Linn. The leaves, though now rarely used, have been recommended as emmenagogue and alexipharmic.

DI'DYMI, (from διδυμος, *double)*, twins; an old name for the testicles, and also two eminences of the brain, from their double protuberance.

DIDYNA'MIA, (from δις, *bis*, twice, and δυναμις, *potentia*, power), in the Linnæan system of botany, a class of plants the fourteenth in order. This term signifies the *power* or *superiority of two*, and is applied to this class, because its flowers have four stamina, of which there are two longer than the rest, and are supposed more efficacious in fecundating the seeds; a circumstance which distinguishes it from the fourth, where the four stamina are equal. It includes two orders. See Botany.

DIERVI'LLA, (named in honour of Mr. Dierville, who first brought it from Arcadia); a species of honeysuckle; the *Conicera Diervilla, racemis terminalibus, foliis serratis*, Linn. The young branches of this are employed in North America as a remedy in gonorrhœa and suppression of urine. As far as we know, it has not yet been exhibited in Europe.

DIET, (*dieta*, of the Gr. διαιταγω, *to nourish*). This, according to some, comprehends the whole

regimen or rule of life with regard to the six non-naturals; air, meats and drinks, sleep and watching, motion and rest, passions of the mind, retentions and excretions. Others restrain the term *diet* to what regards eating and drinking, or solid aliments and drinks. See Food. The natural constitution of the human body is such, that it can easily bear some changes and irregularities without much injury. Had it been otherwise, we should be almost constantly put out of order by every slight cause. It is certain, however, that we constantly do a violence to nature by the inordinate way in which our appetites are indulged. Indeed there are few possessed of the opportunity, who, tempted no less by the varieties of the table than by luxurious habits, do not fall into excesses that tend to produce diseases, and abridge the term of their existence.

Dr. Willich says, " Weakly individuals ought to eat frequently, but little at a time: the number of meals should correspond with the want of strength ;—it is less hurtful to a debilitated person, to eat a few mouthfuls every hour, than to make two or three hearty meals in one day.

" There is no instance on record of any person having injured his health or endangered his life by *drinking water* with his meals; but wine, beer, and spirits have generated a much greater number and diversity of patients, than would fill all the hospitals in the world. Such are the effects of intemperance in diet, particularly in the article of drink; for neither beer, wine, nor spirits are of themselves hurtful, if used with moderation, and in a proper habit of body. It is a vulgar prejudice, that water disagrees with many constitutions, and does not promote digestion so well as wine, beer, or spirits: on the contrary, *pure water* is greatly preferable to all brewed and distilled liquors, both with a view of aiding the digestive organs, and preventing complaints which arise from acrimony, or fulness of the blood.

" It is an observation not less important than true, that by attending merely to a *proper diet*, a phlegmatic habit may frequently be changed into a sanguine one, and the hypochondriac may be so far converted as to become a cheerful and contented member of society.

" The duration of *work* or *exercise* cannot be easily ascertained with regard to every individual. Generally speaking, we ought to work only when we feel a natural inclination to either literary or mechanical labours. To force ourselves to any exertions, particularly those of the mind, is productive of indifferent performances.—It is better to exercise the mind in fine than in bad weather; but those who are continually making excursions in the former, cannot at all times usefully appropriate in the latter. Of the twenty-four hours in a day, we ought, in a good state of health, to devote upon an average, twelve hours to useful occupations, six to meals, amusements, or recreations, and six to sleep".

Diet was the first, the principal, and often the only remedy made use of by Hippocrates in the cure of diseases. By means of it, he opposed (to use his own language) moist to dry, hot to cold, &c.; and what he looked upon to be the most considerable point was, that thus he supported Nature, and assisted her to overcome the malady. The dietetic part of medicine was so much the invention of this great physician, that he was very desirous to be accounted the author of it; and the better to make it appear that it was a new remedy in his days, he says expressly, that the ancients had written almost nothing concerning the diet of the sick, having omitted this point, though it was *one of the most essential parts of the art.*

The diet prescribed by Hippocrates for patients labouring under acute, differed from that which he ordered for those afflicted with chronical, distempers. In the former, which require a more particular exactness in relation to diet, he preferred liquid food to that which was solid, especially in fevers. For these he used a sort of broth made of cleansed barley; and to this he gave the name of *ptisan.* See Ptisan.

He would not allow eating twice a-day, to those who eat but once in that time when in health. In the paroxysm of a fever he gave nothing at all; and in all diseases where there are exacerbations, he forbad nourishment while the exacerbations continued. He let children eat more; but those who were grown up to man's estate, or were of an advanced age, less; making allowance, however, for the custom of each particular person, or for that of the country.

But though he was of opinion that too much food ought not to be allowed to the sick, he was not of the mind of some physicians who prescribed long abstinence, especially in the beginning of fevers. The reason he gave for this was, that the latter practice weakened the patients too much during the first days of the disorder, by which means their physicians were obliged to allow them more food when the illness was at its height, which in his opinion was improper. Besides, in acute diseases, and particularly in fevers, Hippocrates made choice of refreshing and moistening nourishment; and amongst other things prescribed orange, melon, spinach, gourd, and dock. This sort of food he gave to those that were in a condition to eat, or could take something more than a ptisan.

The drink he commonly gave to his patients was made of eight parts of water and one of honey. In some distempers they added a little vinegar; but besides these, they had another sort named κυκεων, or *mixture.* One prescription of this sort we find intended for a consumptive person: it consisted of

rue, anise, celery, coriander, juice of pomegranate, the roughest red wine, water, flour of wheat and barley, with old cheese made of goats' milk. Hippocrates did not approve of giving plain water to the sick; but though he generally prescribed the drinks above mentioned, he did not absolutely forbid the use of wine, even in acute disorders and fevers, provided the patient were not delirious nor had pains in the head. Besides, he took care to distinguish the wines proper in these cases; preferring to all other sorts white-wine that is clear and has a great deal of water, with neither sweetness nor flavour.

These are the most remarkable particulars concerning the diet prescribed by Hippocrates in acute diseases: in chronic affections he made very much use of milk and whey; though we are not certain whether this was done on account of the nourishment expected from them, or because he accounted them medicines.

DIET-DRINKS, a form of physic, including all the medicated wines, ales, and wheys, used in chronic cases. They require a course or continuation to answer any good intention. The following is the receipt for what is called the *Lisbon diet-drink.*

Decoctum Sarsaparillæ Compositum. Lond. Dubl.

Take of the root of sarsaparilla, sliced and bruised, six ounces;
Bark of the root of sassafras,
Shavings of guaiacum wood,
Liquorice root, bruised, of each one ounce;
Mezereon, three drachms;
Distilled water, ten pints.

Macerate these with a gentle heat, for six hours; then boil it down to five pints, adding, towards the end of the boiling, the mezereon, and strain the liquor.

The Dublin college only differ in adding the liquorice root along with the mezereon, and in reducing the quantity of the ingredients used, to one fourth part. This decoction was once highly celebrated, and for a long time after its first introduction into Britain, was kept a secret; but an account of the method of preparing it was at length published by Dr. Donald Monro. It operates as a diaphoretic, and may be given with advantage in rheumatic cases, and in some of the sequelæ of syphilis. Three or four ounces are taken three or four times a-day.

Other diet-drinks have been employed, particularly in scurvy, and in cutaneous affections, but they are fallen greatly into disuse.

DIETETICS; that part of medicine which considers the way of living with relation to food, or diet suitable to any particular case of disease. See Diet.

DIGASTRICUS, (from δις, *twice*, and γαστηρ, *a belly*), or *biventer maxillæ inferioris;* a muscle so called from its having two bellies, situated externally between the lower jaw and *os hyoides.* It arises, by a fleshy belly, from the upper part of the processus mastoidæus, and descending, it contracts into a round tendon, which passes through the stylo-hyoidæus, and an annular ligament which is fastened to the os hyoides; then it grows fleshy again, and ascends towards the middle of the edge of the lower jaw, where it is inserted. Its use is to open the mouth by pulling the lower jaw downwards and backwards; and when the jaws are shut, to raise the larynx, and consequently the pharynx, upwards, as in deglutition.

DIGESTER, a strong vessel or engine, contrived by M. Papin, to boil, with a very strong heat, any bony substances, so as to reduce them into a fluid state.

DIGESTION, (*digestio*, from *digero*, to dissolve); the change that the food undergoes in the stomach, by which it is converted into chyme. See Chyme. The circumstances necessary to effect a healthy digestion of the food are: 1. A certain degree of heat in the stomach. 2. A perfect mixture of saliva with the food in the mouth. 3. A certain quantity of healthy gastric juice. 4. The natural peristaltic motion of the stomach. 5. The pressure of the contraction and relaxation of the abdominal muscles and diaphragm. From these circumstances, the particles of the food are softened, dissolved, diluted, and intimately mixed into a soft pap, called chyme, which passes through the pylorus into the duodenum, where it undergoes a farther preparation by which it is enabled to yield chyle, which last is absorbed by the lacteals, and converted into blood.

By *digestion*, the specific differences of all substances are abolished: the blood, formed from different kinds of aliment, whether used singly or together, does not sensibly differ in its properties, provided that the organs of digestion be sufficiently powerful to convert them. The action of the stomach alone is capable of effecting this process, and the power of animal digestion can alone assimilate it into our own nature. See Assimilation.

When the aliment is converted into chyle (see Chyle) by being digested in the stomach, it is carried into the duodenum, where, mixing with the bile, the nutritious parts are separated, and the rest is conveyed through the intestines, to be thrown out by the large intestines as excrement. The chyle when separated from the alimentary mass in its descent, is conveyed by the lacteals into the receptaclum chyli, and thence into the left subclavian vein, where it begins its circulation with the blood.

Many causes concur to the promotion of digestion; such as the aids of cookery (see Cookery);

the preparation of mastication; the mixture of saliva with what we eat (see SALIVA), and of other juices in the œsophagus and stomach; and, lastly, in the duodenum, the mixture of bile, and of the pancreatic juice.

The considerable length of the small intestines, which are upwards of five times longer than the body, the great surface of the villous membrane increased by folds, the incredible number of exhaling or absorbent vessels, the slow course of the feces through the large intestines, and the great quantity of the intestinal juices poured into the alimentary mass; all conduce to the preparation of the chyle, to its absorption into the lacteals, to the abstertion of viscidities from the intestine, to the avoiding adhesions and coagulations, and to the destruction of any acrid diathesis. Hence, in general, the intestines are long in animals that feed upon hard diet, but short in carnivorous ones, and shortest in all those that feed upon juices: and, Haller says, that even in man, an uncommon shortness of the intestines has been known to be attended with hunger, and a discharge of fœtid and fluid feces.

The heat in which the aliment is retained, and which is exceedingly proper for the solution of the gelatinous matter, and for exciting a suitable degree of putrefaction, is the principal cause of the fœtor which is gradually produced in the aliment; hence also the useful part of it, rendered more fluid, is the better adapted for absorption. What remains, after the chyle has been abstracted, consists of some portion of the bile, rendered more mucilaginous; some part of the mucus of the intestines; most of the earthy parts of the food; all those parts which were rejected by the absorbing mouths of the lacteals, yet changed by putrefaction; and lastly, all the solid fibres and membranes, whose cohesion was too great to be overcome by the digestive powers of the stomach. All these remains pass from the extremity of the ileum into the cæcum, in which they are first collected, and afterwards pass into the rectum, from whence they are ejected by stool.

From the observations and experiments of the late Mr. John Hunter, it appears that the stomach has no power over any animal substance endued with the vital principle. "Hence it is," says he, "that we find animals of various kinds living in the stomach, or even hatched and bred there; but the moment that any of these lose the living principle, they become subject to the digestive powers of the stomach. If it were possible, for example, for a man's hand to be introduced into the stomach of a living animal, and kept there for some considerable time, it would be found that the dissolvent powers of the stomach could have no effect upon it: but, if the same hand were separated from the body, and introduced into the same stomach, we should then find, that the stomach would immediately act upon it. Indeed, if this were not the case, we should find that the stomach itself ought to have been made of indigestible materials; for, if the living principle was not capable of preserving animal substances from undergoing that process, the stomach itself would be digested. But we find, on the contrary, that the stomach, which at one instant, that is, while possessed of the living principle, was capable of resisting the digestive powers which it contained, the next moment, viz. when deprived of the living principle, is itself capable of being digested, either by the digestive powers of other stomachs, or by the remains of that power which it had of digesting other things."

When the bodies of dead persons are opened some time after death, a considerable aperture is frequently found at the greatest extremity of the stomach. "In these cases," says Mr. Hunter, "the contents of the stomach are generally found loose in the cavity of the abdomen, about the spleen and diaphragm. In many subjects, this digestive power extends much farther than through the stomach. I have often found, that, after it had dissolved the stomach at the usual place, the contents of the stomach had come into contact with the spleen and diaphragm, had partly dissolved the adjacent side of the spleen, and had dissolved the ~~stomach~~ quite through; so that the contents of the stomach were found in the cavity of the thorax, and had even affected the lungs in a small degree."

From the experiments of Reaumur and Bertier it appears, that the stomachs of granivorous animals digest their contents partly by trituration, and of carnivorous ones principally by solution in the gastric fluid. See GASTRIC JUICE.

The late Dr. Geo. Fordyce, in his Gulstonian Lecture, after describing the structure of the organs of digestion, and the matters applied to the food in those organs; asserts, that the substances employed for food, have all of them the same elements exactly, and each all the elements necessary for the formation of chyle, that is, all the elements that are actually found in chyle. There is first, he says, *a part* which is fluid, and contained in the lacteals, but coagulates on extravasation;—a *second*, which consists of a fluid coagulable by heat, and, in all its properties that have been observed, is consonant to the serum of blood: and a *third* formed of globules, which render the whole white and opaque. He says, that it is therefore only necessary, that these elements should be separated from one another, and recombined, in order to form chyle. The action of the stomach, duodenum, and perhaps jejunum, together with the fluids applied, induce, in the matter employed for food, one operation, by which its elements are disunited, and re-united in a new manner, and into a new matter; which matter, although it may be mixed with other substances, is in itself always the same in all its pro-

perties. This matter, by a new operation induced by the action of the duodenum, and the fluids it meets with there, must have its elements again disunited and reunited, so as to form the essential parts of the chyle, which therefore cannot be influenced in the smallest degree by the food. It is evident then, that these three essential parts of the chyle, are always the same, and therefore, when converted into blood, the blood, *à fortiori*, cannot in the smallest degree be influenced by the kind of food. Moreover, says the Doctor, suppose a sufficient quantity of food was employed, and the organs of digestion were sufficiently powerful in their action, and the fluids applied were properly added, yet no more than a sufficient quantity of blood would be formed; too large a quantity of food would not produce too large a quantity of blood. Hence, according to this truly great and eminent physician, digestion is performed on substances containing all the elements of chyle, by these substances, thrown into the stomach and other organs of digestion, having their elements separated from one another by the powers of the stomach, and these organs acting upon them; occasioning in them a decomposition, and recombination of their elements into a new substance.

DIGESTION, in chemistry and pharmacy, an operation in which such matters as are intended to act slowly on each other, are exposed to a slow heat, continued for some time. Digestion differs from maceration only in the activity of the menstruum being promoted by a gentle degree of heat. It is commonly performed in a glass matrass, which should only be filled one third, and covered with a piece of wet bladder, pierced with one or more small holes, so that the evaporation of the menstruum may be prevented as much as possible, without risk of bursting the vessel. The vessel may be heated, either by means of the sun's rays, of a common fire, or of the sand-bath; and when the last is employed, the vessel should not be sunk deeper in the sand than the portion that is filled. Sometimes when the menstruum employed is valuable, a distilling apparatus is used to prevent any waste of it. At other times, a blind capital is luted on the matrass, or a smaller matrass is inverted within a larger one: and as the vapour which arises is condensed in it, and runs back into the larger, the process in this form has got the name of *circulation*. See Circulation.

DIGESTIVES, (*digestiva;* from *digero*, to dissolve); a term applied by surgeons to those ointments or other substances, which, when applied to an ulcer or wound, promote suppuration: such are the *unguentum resinæ flavæ*, *unguentum elemi*, *balsamum capaiva*, warm poultices, fomentations, &c. Of this class of remedies Dr. Cullen says: "There are certainly various medicines which seem to answer the purpose of producing a laudable pus, in wounds and ulcers; but whether they directly contribute to this, or only correct those circumstances which impede the operation of nature, is a little uncertain; and therefore it is doubtful whether the general term be proper or necessary.

DIGITA'LIS, (from *digitus*, a finger; because the flower resembles the finger of a glove in its shape), common fox-glove; *digitalis purpurea*, *calycinis foliolis ovatis acutis*, *corollis obtusis*, *labio superiore integro*, Linn. Class, *Didynamia*. Order, *Angiospermia*. It is an indigenous biennial plant, very common on hedge-banks, and sides of hills, in dry, gravelly, or sandy soils; and the beauty of its appearance has gained it a place in our gardens and shrubberies. The leaves are large, oblong, egg-shaped, soft, covered with hairs, and serrated. They have a bitter, very nauseous taste, with some acrimony.

Its medicinal effects are, to diminish the frequency of the pulse; lessen the irritability of the system; increase the action of the absorbents; and lastly, to increase the discharge by urine. In too large doses, it produces vomiting, purging, dimness of sight, vertigo, delirium, hiccough, convulsions, and death. Dr. A. Duncan says, for these symptoms the best remedies are cordials and stimulants.

Internally, digitalis has been employed, by different practitioners: 1. In inflammatory diseases, from its very remarkable power of diminishing the force of the blood's circulation. 2. In active internal hæmorrhages, in phthisis. 3. In some spasmodic affections, as in the asthma, palpitation of the heart, &c. 4. In mania arising from an effusion on the brain. 5. In anasarcous and dropsical effusions. 6. In scrofulous tumors. 7. In aneurism of the aorta, Dr. A. Duncan says, it has alleviated the most distressing symptoms.

Dr. Withering considers this as one of the most certain diuretics in the whole materia medica. He observes, that it seldom succeeds in men of *great natural strength*, *of tense fibre*, *warm skin*, *florid complexion*, or *in those with a tight*, *cordy pulse*. If the belly, in ascites, *be tense*, *hard*, and *circumscribed*, or *the limbs in anasarca solid* and *resisting*, there is little chance. On the contrary, *if the pulse be feeble*, or *intermitting*, *the countenance pale*, *the lips livid*, *the skin cold*, *the swoln belly soft* and *fluctuating*, *the anasarcous limbs readily pitting with pressure of the finger*, we may expect the diuretic effects to follow in a kindly manner. It may be given in the following forms:

1. *In substance*,—either by itself, or conjoined with some aromatic, or made into pills with soap or gum ammoniac. Dr. Withering directs the leaves to be gathered after the flowering stem has shot up, and about the time when the blossoms are coming forth. He rejects the leaf-stalk, and middle rib of the leaves, and dries the remaining

part either in the sunshine or before the fire. In this state, they are easily reduced to a beautiful green powder, of which we may give at first one grain twice a-day, and gradually increase the dose until it act upon the kidneys, stomach, pulse, and bowels, when its use must be laid aside or suspended.

2. *Infusion.*—The same author directs a drachm of the dried leaves to be infused for four hours in eight ounces of boiling water, and that there be added to the strained liquor an ounce of any spirituous water, for its preservation. Half an ounce or an ounce of this infusion may be given twice a-day.

3. *Decoction.*—Dr. Darwin directs that four ounces of the fresh leaves be boiled from two pounds of water to one, and half an ounce of the strained decoction exhibited every two hours, for four or more doses.

4. *Tincture.*—Put one ounce of the dried leaves coarsely powdered into four ounces of diluted alcohol; let the mixture stand by the fire-side twenty four-hours, frequently shaking the bottle; and the saturated tincture, as Dr. Darwin calls it, must then be separated from the residuum, by straining or decantation. Twenty drops of this tincture may be taken twice or thrice a-day. The Edinbugh college use eight ounces of diluted alcohol to one of the powder, but let it digest seven days.

5. The *expressed juice* and *extract* are not proper forms of exhibiting this very active remedy.

When the digitalis is disposed to excite looseness, opium may be advantageously conjoined with it; and when the bowels are tardy, jalap may be given at the same time, without interfering with its diuretic effects. During its operation in this way, the patient should drink very freely.

This remedy has been fully tried, though not with the wished-for success, in Phthisis. Some encouraging cases, however, are recorded in the Edin. Pract. of Med. &c. Vol. II. Dr. Magennis, alluding to the various contradictory accounts, published at different times, respecting the effects of digitalis in the treatment of pulmonary consumption, says, "Like every new and valuable discovery that has been made and applied to the removal of one or more of the afflicting catalogue of diseases to which the human frame is subject, the fox-glove has experienced the most unbounded praises, and the keenest censure. The advocates for the use of this medicine, as is usual with all new discoveries, have extolled its virtues probably beyond the just bounds of truth, and beyond what will be found warranted by a more general and extensive experience. On the other hand, its enemies have not only denied its possessing any antiphthisical powers whatever, but have absolutely condemned it as a dangerous and *deleterious* drug, which ought to be altogether excluded from medical practice, and ranked only in the class of the most deadly vegetable poisons. The truth is most commonly found *to lie between these extremes*; and in no instance, perhaps, is this general rule more applicable than in the present." We are sorry to add, that our individual experience does not even warrant the Doctor's latter supposition.

Of the digitalis there is an ointment made, in the same manner, and applied to the same uses as that of cicuta; the ingredients are equal parts of the digitalis purpurea, recently gathered, and hog's-lard. See CICUTA.

DIGITA'LIS PURPU'REA; the systematic name of fox-glove. See DIGITALIS.

DIGITATED; a term in botany. Digitated leaves are compound leaves divided into several parts, all of which meet together at the tail, in form of a hand.

DIGITIUM, the name of a kind of *contractura*, by which the joint of a finger is fixed. It denotes also a whitloe, and a pain, with wasting of a joint, of the finger.

DI'GITUS; a finger or toe. The orderly disposition of the bones of the fingers into three rows, has made them generally obtain the name of three *phalanges*; scytalidæ, internodia, scutiluca, agmina, acies, condyli articuli. All of them have half-round convex surfaces, covered with an aponeurosis, formed by the tendons of the extensors, lumbricales, and interossei, and placed directly backwards, for their greater strength: and their flat concave part is forwards, for taking hold more surely, and for lodging the tendons of the flexor muscles. The ligaments for keeping down these tendons are fixed to the angles that are between the convex and concave sides.

The bones of the first phalanx of the fingers answer to the description of the second bone of the thumb; only that the cavity in their base is not so oblong, nor is their motion on the metacarpal bones so much confined: for they can be moved laterally or circularly; but have no rotation, or a very small degree of it, round their axis. Both the ends of this first phalanx are in a cartilaginous state at the birth; and the upper one is afterwards affixed in form of an epiphyse.

The second bone of the fingers has its base formed into two lateral cavities, and a middle protuberance; while the lower end has two lateral protuberances and a middle cavity; therefore it is joined at both ends in the same manner, which none of the bones of the thumb are. This bone is in the same condition with the former, in children.

The third bone differs nothing from the description of the third bone of the thumb, excepting in the general distinguishing marks; and therefore the second and third phalanx of the fingers enjoy only flexion and extension.

The upper end of this third phalanx is a cartilage in a grown child; and is only an epiphyse after, till the full growth of the body.

All the difference of the *phalanges* of the several

fingers consists in their magnitude. The bones of the *middle finger* being the longest and largest;—those of the *fore finger* come next to that in thickness, but not in length, for those of the *ring finger* are a little longer. The *little finger* has the smallest bones. This disposition is the best contrivance for holding the largest bodies; because the longest fingers are applied to the middle largest periphery of such substances as are of a spherical figure.

The bones of the thumb are described under the article THUMB. Those of the toes have no names, but what has been said above applies equally to them.

DI'GITUS MANUS, a finger; thus denominated, in anatomical language, because the term *digitus* is also applied to the toe. See DIGITUS.

DIGITUS PEDIS; a toe. See DIGITUS.

DIGLO'SSON, (from δις, *double*, and γλωσσα, *tongue)*, a name of the *Laurus Alexandrina;* because that, above its leaf, there grows another lesser leaf, resembling a tongue.

DIGY'NIA, (from δις, *bis*, twice, and γυνη, *mulier*, a woman); the second order in each of the first thirteen classes, except the ninth, in the Linnæan system of botany. It comprehends those plants in whose fructification there are two pistilla, which are considered as the female parts of generation. See BOTANY.

DILATA'TIO, a dilatation; a term sometimes used for *diastole.*

DILATA'TION, in physics, a motion of the parts of any body, by which it is so expanded as to occupy a greater space. This expansive motion depends upon the elastic power of the body; whence it appears, that dilatation is different from rarefaction, this last being produced by the means of heat.

DILL. See ANETHUM.

DILUE'NTIA; (from *diluo*, to wash away); *diluents.* See ATTENUANTIA.

DINNER; the meal taken, by Europeans, about the middle of the day. The word is derived from the French *disner*, which Du Cange derives from the barbarous Latin *disnare.* Henry Stephens derives it from the Greek δειπνειν; and will have it written *dipner.* Menage deduces it from the Italian *desinare* "to dine;" and that from the Latin *desinere* "to leave off work." It is generally agreed to be the most salutary to make a sufficient dinner, and to eat sparingly at supper: this is the general practice among us. The French, however, in imitation of the ancient Romans, defer their good cheer till the evening; and Bernardinus Paternus, an eminent Italian physician, maintains it to be the most wholesome method, in a treatise expressly written on the subject. The grand Tartar, Emperor of China, after he has dined, makes publication by his heralds, that he gives leave for all the other kings and potentates of the earth to go to dinner; as if they waited for his leave. See DIET, FOOD, &c.

DIOCTAHE'DRIA, a genus of pellucid and crystalliform spars, composed of two octangular pyramids, joined base to base, without any intermediate column. Of these some have long pyramids, others short and sharp-pointed ones, and others short and obtuse-pointed ones; the two former species being found in the Hartz-forest, and the last in the mines of Cornwall.

DIŒ'CIA, (from δις, *twice*, and οικια, *a house*, or *habitation)*, two houses; the name of the 22d class in Linnæus's sexual method. It consists of plants which, having no hermaphrodite flowers, produce male and female flowers on separate roots. These latter only ripen seeds; but require for that purpose, according to the sexualists, the vicinity of a male plant; or the aspersion, that is, sprinkling, of the male dust. From the seeds of the female flowers are raised both male and female plants. The plants then in the class diœcia are all male and female; not hermaphrodite, as in the greater number of classes; nor with male and female flowers upon one root, as in the class monœcia of the same author. See BOTANY.

DIO'NIS (Peter), a famous surgeon, born at Paris, distinguished himself by his skill in his profession, and by his works; the principal of which are. 1. A course of operations in surgery; 2. The anatomy of man; and, 3. A treatise on the manner of assisting women in child-birth. He died in 1718.

DIORRHO'SIS, (διορρωσις, from ορος, or οῤῥος, *serum)*; a term signifying the conversion of the humours into serum and water.

DIOSCO'REA, a plant so named in honour of Dioscorides.

DIOSCO'REA ALA'TA. See YAMS.

DIOSCO'REA BULBI'FERA. See YAMS.

DIOSCO'REA SATI'VA. See YAMS.

DIOSCO'RIDES (Pedacius), an eminent physician of Anaxarba, since called Cæsarea, in Cilicia, who flourished in the reign of Nero, and composed five books of the "Materia Medica." Besides these five books, there are a sixth and a seventh mentioned by Photius; but the genuineness of them is justly doubted, since Galen takes no notice of them at all, in several places where he could hardly be supposed to overlook them. There are also two other books "upon simple and compound medicines easy to be come at," which have been attributed to Dioscorides; but these are supposed to be spurious, though they seem to have borne his name when Ætius read them. The first edition of Dioscorides's works was published in Greek, by Aldus, at Venice, in 1499; they have often been published since, with versions and notes.

DIOSPY'ROS LOTUS. See INDIAN DATE PLUM.

DI'PLOE, (from διπλοω, *to double*), also called *Meditullium;* the spungy substance between the two tables of the skull. The diploë has nearly the same texture and uses, in the skull, with the cancelli in other bones. See CRANIUM.

In several old subjects it is so obliterated, that scarce any vestige of it can be seen; neither is it observable in some of the hard craggy bones at the base of the skull. This is an useful caution to surgeons who trust to the bleeding, want of resistance, and change of sound, as certain marks, in the operation of the trepan, that their instrument has sawed through the first table, and reached the diploë. In other instances, the diploë becomes of a monstrous thickness, while the tables of the skull are thinner than paper.

DIPLO'MA, in a peculiar sense, is used for an instrument or licence given by colleges, societies, &c. to a physician to practise medicine, after having passed an examination. See COLLEGE OF PHYSICIANS.

DIPLO'PIA, (διπλωπια: from διπλοος, *double*, and οπτομαι, *to see), visus duplicatus ;* that disease of the eye, in which the patient sees double or triple. It is sometimes the effect of a concussion of the brain.

DI'PSACOS, (διψακος, from διψα, *thirst) ;* a name for the DIABETES.

DIPYRI'TES, (διπυριτης, or *dipyros*, from δις *twice*, and πυρ, *fire) ;* bread twice baked. Hippocrates recommends it in dropsies.

DIRE'CTOR, in surgery, a grooved probe, to direct the edge of the knife or scissars, in opening sinuses or fistulæ; that by this means the adjacent vessels, nerves, &c. may remain unhurt.

DISCE'SSUS, an old chemical term, which the French call *depart*, or *linquart:* it signifies in general, any separation of two bodies before united ; but, it is particularly applied to the separation of gold from silver by means of nitrous acid, where the silver is dissolved, but the gold left untouched.

DISCO'IDES, (from δισκος, the *quoit* used in the Roman games, and ειδος, *a form*), an epithet applied to the crystalline lens of the eye, from its form resembling a disk.

DI'SCUS, in botany, the middle part of a radiated compound flower, generally consisting of small florets, with a hollow regular petal. It is commonly surrounded by large, plain, or flat, tongue-shaped petals, in the circumference or margin ; as in daisy, groundsel, and leopard's bane : sometimes the circumference is naked, as in cotton-weed and some species of colts-foot. *Discus folii*, signifies the surface of the leaf.

DISCUTIENTS, *(discutientia;* from *discutio*, to shake in pieces) ; a term in surgery, applied to those substances which possess a power of repelling or resolving tumors. Dr. Cullen describes them as " medicines supposed to dispel tumor or hardness." Their operation, he adds, is of different kinds, and therefore the general term should, if possible, be avoided.

DISDIACLA'STIC CRYSTAL, a name given by Bartholine, and some others, to the pellucid fossile substance, more usually called, from the place whence it was first brought, *Iceland crystal;* though properly it is no crystal at all, but a fine pellucid spar, called by Dr. Hill, from its shape, *parallelopipedum.*

DISEASE, a term which has been variously defined by physicians, almost every founder of a new system having given a definition of it, different in some respects from his predecessors. The late Dr. Geo. Fordyce, in his Elements of the Practice of Physic, says, " A disease is such an alteration of the chemical properties of the fluids or solids, or of their organisation, or of the action of the moving power, as produces an inability or difficulty of performing the functions of the whole, or any part of the system, or pain, or præternatural evacuation."

Of all animals, man is the most subject to diseases ; and of men, the studious and speculative are most exposed to them. Other animals have their diseases, but they are small in number ; nor are plants without them. Some diseases only impair the use of the part immediately affected; as the ophthalmia, gout, &c. others destroy it entirely ; as the *gutta serena*, palsy, &c. Some affect the whole body ; as in fever, apoplexy, epilepsy, &c. others only impair a part; as the asthma, colic, dropsy, &c. Some only affect the body; as the gout: others disturb the mind; as hypochondria, delirium, &c. Lastly, others affect both the body and mind; as mania, phrenitis, &c. See EPIDEMIC, ENDEMIC, &c.

Some functions of the human body relate to itself only, and others to external things. To the latter class belong those which, by physicians, are called the *animal functions ;* to which are to be referred all our senses, as well as the power of voluntary motion, by which we become acquainted with the universe. Among the functions which relate to the body, some only have been named *vital*, such as the circulation of the blood, and respiration ; because, without the constant continuance of these, life cannot subsist. Others, intended for repairing the waste of the system, have been termed the *natural functions ;* for by the constant attrition of the solids, and the evaporation of the fluid parts of the body, we stand in need of nourishment to supply this waste; after which the putrid and excrementitious parts must be thrown out by the proper passages. The digestion of the food, secretion of the humours, and excretion of the putrid parts of the food, are referred to this class ; which, though necessary to life, may yet be interrupted for a considerable time without danger.

Disease takes place when the body has so far declined from a sound state, that these functions are either quite impeded, or performed with difficulty. A disease therefore may happen to any part of the body, either solid or fluid, or to any one of the functions: and those may occur, either singly, or several may be joined together; whence the distinction of diseases into *simple* and *compound.*

We have examples of the most simple kinds of disease, in the rupture or other injury of any of the corporeal organs, by which means they become less fit for performing their offices; or, though the organs themselves should remain sound, if the solids or fluids have degenerated from a healthy state; or if, having lost their proper qualities, they have acquired others of a different, perhaps of a noxious nature; or lastly, if the moving powers shall become too weak or too strong, or direct their force in a way contrary to what nature requires. The most simple diseases are either productive of others, or of *symptoms* by which alone they become known to us. Every thing in which a sick person is observed to differ from one in health is called a *symptom;* and the most remarkable of these symptoms, and which most constantly appear, define and constitute the disease.

The causes of diseases are various; often obscure, and sometimes totally unknown, as has been stated under the article Causes. Their division has usually been into *acute* and *chronic;* but, some think, the division would be better if the distinction were into febrile and non-febrile. Dr. Cullen, and several other professors of medicine, have arranged diseases under their respective classes, orders, genera, &c. See Nosology.

DISLOCATION, *(dislocatio,* from *disloco,* to put out of place), the same as luxation. It is the secession of a bone of a moveable articulation from its natural cavity. See Luxation.

DISPENSARY, a kind of charitable institution of late years very prevalent in Britain, particularly in the metropolis, where they are distinguished by different titles, as the *General Dispensary,* the *Royal Universal Dispensary,* &c. They are supported by voluntary subscriptions, have each one or more physicians and surgeons, whose business it is to attend at stated times, in order to prescribe for the poor; and, if necessary, to visit them at their own habitations. It is in this latter respect that the patients of a dispensary differ from those called *out-patients* at an hospital. The poor are supplied gratis with their medicines, and many of these institutions also afford gratuitous assistance to lying-in women. Formerly there were three dispensaries established in London, for *selling* medicines to the poor at prime cost, under the direction of the College of Physicians.

Many abuses have been found to exist in the management of these charities, which, in some cases, have been set on foot for the mere purpose of raising some young practitioner into notice; whilst the contributions thus drawn from the public, have lessened those before appropriated to the hospitals, almost to the entire ruin of the latter. We would recommend to the latter, at once as a measure of self-defence, and fraught with more substantial benefits to the poor, the election of an additional physician and surgeon, who should have the entire charge of the out-patients, and *visit them,* when necessary, *at their own habitations.* As a reward for this most troublesome appointment, these gentlemen might be successively elected on the old establishment, as vacancies should occur.

DISPENSATORY, a book containing the method of preparing the various kinds of medicines used in pharmacy. Such are the London, Edinburgh, and Dublin Pharmacopœias, &c.

DISPOSITION, in human nature. In every man there is something original, that serves to distinguish him from others, that tends to form a character, and to make him meek or fiery, candid or deceitful, resolute or timorous, cheerful or morose. This original bent, termed *disposition,* must be distinguished from a *principle:* the latter, signifying a law of human nature, makes part of the common nature of man; the former makes part of the nature of this or that man. This term is also used in speaking of the tendency to bodily disease: we say a *morbid disposition,* a *healthy disposition. &c.*

DISSECTION, *(dissectio,* from *disseco,* to cut asunder), the cutting up a dead body with a view to examine the structure and use of the parts. See Anatomy. Le Gendre observes, that the dissection of a human body, was held a sacrilege till the time of Francis I. and the same author assures us, he has seen a consultation held by the divines of Salamanca, at the request of Charles V. to settle the question, whether or no it were lawful, in point of conscience, to dissect a human body in order to learn its structure.

Surgeons are often called to investigate the cause and seat of diseases and death, either by the relations of the deceased, or the magistrates to whom a report is to be made; therefore, at the time of performing this operation, minutes should be taken of what is observed. The instruments, and all things necessary, should be disposed in order, as for any other operation; as knives, a razor, a great and small saw, scissars straight and curved, elevators, needles threaded, sponges, tow, saw-dust or bran, basons with water, towels, and receivers for the viscera, when they are to be taken out of their cavities. The body is to be laid upon a suitable table, advantageously placed for the light, having a cloth thrown over the parts which decency demands should be concealed, especially in females.

When it is intended only to inspect *the abdomen*

and its contents, a longitudinal incision from the xiphoid cartilage to the os pubis, intersected by a transverse one at the navel, will give a fair opportunity of answering these purposes, when the angles are reversed. Sould it be required to examine all the three cavities, and the parts contained in them, we are to begin by opening *the head*, making an incision quite across the bone, from ear to ear; which section is preferable to the crucial, commonly made on this occasion: then the scalp may be easily dissected from the skull, and turned down over the face, and towards the neck, giving room for the saw. The head must be held very steadily by an assistant during the sawing, which should be begun on the middle of the frontal, proceeding to each temporal bone, and so to finish the circle upon the middle of the occipital bone; which may generally be done conveniently enough by raising the head and inclining it forward after having proceeded as far as this bone; or the body may then be turned prone, should that posture be found more convenient to complete the circle. The cap of the skull is then to be raised with the elevator, occasionally cutting the adhesions of the dura mater; after this the encephalon is to be removed, carefully separating the other attachments of the membrane.

In order to bring the *thorax and abdomen*, with the parts contained in these cavities, under our view, an incision is to be made on each side of the sternum, in the course of the cartilages of the ribs which are annexed to it; dissecting from thence the muscles with the teguments, the space of two or three inches towards the spine; then cutting through the cartilages, which will be seen, and easily divided with a knife a little curved near the point. Then the incisions are to be continued from the sternum through the abdominal cavity, in an oblique direction, to each ilium or inguen; after which the clavicles are to be separated from the sternum, or this bone divided at the superior cartilaginous junction, with a strong knife, dissecting it from the mediastinum, and turning it downwards with the muscles, &c. of the abdomen. This is the most eligible manner of opening these cavities, and gives an opportunity of sewing them up with a better appearance for any person's view afterwards. That kind of stitch called by sempstresses the *herring-bone*, or *flat-seam*, has a very pretty and neat effect upon these occasions.

If it is purposed to take out the thoracic and abdominal viscera together, for further examination, the diaphragm is first to be cut down to the spine on both sides; then, to avoid being incommoded with blood, &c. two very strong ligatures are to be passed round the œsophagus and large blood-vessels, in which the trachea may be included; tying them hard, and then dividing these parts between the ligatures: the same measures are to be taken in respect to the inferior vessels upon the lumbar region, a little above the bifurcation of the aorta, including the vena cava; and also upon the rectum. After having observed these precautions, the viscera, with the diaphragm, are to be removed by a cautious dissection, all the way close to the spine; and by gently drawing them at the same time, the separation will be greatly facilitated.

When the thoracic and abdominal viscera are to be taken out separately; in the first case ligatures must be made, as have been described, upon the vessels, &c. just above the diaphragm, and in the other just below it, and upon the rectum.

Should we be called upon to perform this office *when the body is become very putrid*, it will be absolutely necessary to have such parts of it well washed with warm vinegar and brandy, and then sprinkled with camphorated spirit or some such odoriferous antiputrescent liquor, before the examination, in order to correct the stench, and defend us against the noxious quality of the effluvia; a precaution, the neglect of which may be attended with very direful effects.

Human dissections are most frequently undertaken by medical students; a perfect knowledge of the structure of the body being indispensible to that of its diseases. To such we earnestly recommend the works of Mr. C. Bell, a late writer on the subject, which will serve to direct the reader's judgment in this pursuit.

"From what I have seen of private dissection", says Mr. Bell. "I would rather advise those who are desirous of undertaking a complete course of dissections, not to begin their labours with learning all the muscles of the body; for this, besides other disagreeable circumstances, is a dry and tedious task at first. It will perhaps be found more truly useful, to begin their dissections with general views to the economy of such parts as, from lectures or books, they know to be of importance; then proceeding, in a more determined way, to study rigidly the anatomy of the bones and muscles, and accidents of the great joints,—the blood-vessels and nerves, and the anatomy of the great operations of surgery.

"During dissection, there are many little operations which should be practised, and which are neglected. The introducing, for example, of probes into the ducts, as into the nasal duct, and into the ducts of the salivary glands; the introducing of instruments into the nose and throat, and into the Eustachian tube; the use of the probang, and of the catheter, &c. Knowledge and dexterity in such points often prove more useful, as being oftener required, than the greater operations of surgery."

After a nice description of the mode of dissecting the abdominal muscles, the *linea alba*, the *linea semilunaris*, &c. the author gives some very judicious

directions respecting dissection in cases of hernia, dropsy, and ascites, as connected with the anatomy of these muscles.

"Active inflammation", he adds, "should be distinguished from turgidity of the vessels; for often a fulness of the veins, mechanically produced, is described as an active inflammation in the brain and in the pleura, and still oftener in the abdomen. In dropsy, in violent distension of the intestines, in tympanites intestinalis, and after child-bearing, the veins of the intestines and peritoneum are often found distended with blood. But in real inflammation, the peritoneum becomes thickened, pulpy, and less transparent—the blood is also of a brighter red colour; a circumstance which seems not to be owing to a peculiar property in the inflamed part, of preserving the arterial colour of the blood (as Mr. Hunter suggests), but to its more general suffusion.

"As the eye becomes dry and painful, and inflamed, when the eye-lids are forcibly kept open and prevented from spreading the secretion upon its surface; so, when the enveloping membrane of the viscera is exposed, the natural secretion of its surface is destroyed, and it is irritated and inflamed. Or, by inflammation from any other cause, the secretion is destroyed; the parts lying in contact are no longer kept separate; they mutually affect each other; and, producing a new action, unite.

"Adhesions are produced in the peritoneum and intestines in a very short time; and the smooth membrane, when it is torn from its new connexions, appears cellular; or, upon being cut, thickened and solid—or if the surface has undergone severe inflammation (without being allowed to perform these adhesions, which are frequently the consequence of inflamed peritoneum), its surface becomes ragged, and numerous flocculi of new membranes are formed upon it.

"In diseases where inflammation has spread among the viscera, it is generally understood that the peritoneum is the original seat of the inflammation.—And, according to this view of the subject, it appears upon dissection, that the intestines do, more readily than the muscles, participate in the inflammation of the peritoneum. The muscles are indeed guarded in some measure by the loose cellular substance, which separates them from the peritoneum; but this does not satisfactorily account for what, in the above view, appears to be so great a a difference, between the sympathy of the intestines, and that of the muscles, with the peritoneum. The true explanation seems to be, that the disease or inflammation is in general communicated, not from the peritoneum to the intestines, but from the intestines to the peritoneum. It is the disease of the intestines which produces those deadly symptoms that are said to mark inflammation of the abdominal cavity; and although there are diseases in which the peritoneum is peculiarly the seat of inflammation, yet the inflammation of the peritoneum, produced by any external cause, is dangerous only by propagating its inflammation to the intestines."

The author's observations on the *stomach*, *duodenum*, and *liver*, are no less worthy of the student's attention; but for these we refer to the work itself.

DISSEPIME'NTUM, in Botany, the name by which Linnæus denominates the partitions which, in dry seed-vessels, as capsules and pods *(siliqua)*, divide the fruit internally into cells.

DISSOLU'TION, a discontinuation, or analysis, of the structure of a mixed body; whereby, what was one, and contiguous, is divided into little parts, either homogeneous or heterogeneous. Dissolution, then, is a general name for all reductions of concrete bodies into their smallest parts, without any regard either to solidity or fluidity; though in the usual acceptation of the word among authors, it is restrained to the reduction of solid bodies into a state of fluidity; which is more properly expressed by *solution*, as a branch of *dissolution*. According to the opinion of Fr. Tertius de Lanis, Boerhaave, and some other learned men, the power or faculty of dissolving exists in fire alone. Sir Isaac Newton accounts for all dissolutions, and their several phenomena, on the great principle of attraction; and, in effect, the phenomena of dissolution furnish a great part of the arguments and considerations whereby he proves the reality of that principle. See CHEMISTRY.

DISTASTE, properly signifies an aversion, or dislike, to certain foods; and may be either constitutional, or owing to some disease of the stomach.

DISTEMPER, the same with disease. See DISEASE.

DISTICHI'ASIS, (διςιχιασις; from διστιχια, from δις, *double*, and ςιχος, *a row*); a disease of the eyelash, in which there is a double row of hairs, the one row growing outwards, the other inwards towards the eye. The cure consists in plucking out the inverted hairs, with a fine pair of spring forceps, so as to prevent their brushing and irritating the conjunctiva.

DISTILLATION, (from *distillo*, to drop by little and little), a chemical process, very similar to evaporation; instituted to separate the volatile from the fixed principles of the materials distilled, by means of fire. *Distillation* is said to be performed in the *humid* way, when fluids are the subjects of the operation; and in the *dry* way, when solids are subjected to the operation, and the fluid product arises from decomposition, and a new arrangement of the constituent principles. The objects of distillation are: 1. To separate volatile fluids from less volatile, or from solids. 2.

To promote the union of different substances. 3. To generate new products by the action of heat. In no distillation should the heat be greater than is necessary for the formation of the vapour, and even to this degree it should be raised gradually. The vessels also in which it is performed, should never be filled above one-half, and sometimes not above one-fourth, lest the substances contained in them should boil over.

Distillation being a combination of evaporation and condensation, the apparatus consists of two principal parts; first, the vessels in which the vapours are formed; secondly, the vessels in which they are condensed. Those employed for both purposes are very various in their shapes, according to the manner in which the operation is conducted. The first difference depends on the direction in which the vapour passes after its formation. It either descends, *i. e.* distillation *per descensum;* ascends, distillation *per ascensum*, as in common instances; or it passes off by the side, which is called distillation *per latus*.

In the first method, viz. *per descensum*, a perforated plate of tinned iron, or other material, is fixed within any convenient vessel, so as to leave a space beneath it. On this the subject of the operation is laid, and over it is placed another plate, accurately closing the mouth of the vessel, and sufficiently strong to support the fuel. Thus the heat is applied from above, and the vapour is forced to descend into the inferior cavity, where it is condensed. In this way the oil of olives is prepared; and, on the same principles, tar is manufactured, and mercury and zinc are separated from their ores.

In distillation *per ascensum*, the vapour is allowed to rise to some height, and then is conveyed downwards to be condensed by cold. The vessel employed for this purpose is the common copper still, which consists of a body for containing the materials, and a head into which the vapour ascends. From the middle of the head a tube rises for a short time, and is then reflected downwards, through which the steam passes to be condensed. Another kind of head, rising to a great height before it is reflected, is sometimes used for separating fluids which differ little in volatility, as it was supposed that the less volatile vapours would be condensed and fall back into the still, while only the more volatile vapours would arise to the top, so as to pass to the refrigeratory. The same object may be more conveniently attained by managing the fire with caution and address. The greater the surface exposed, and the less the height the vapours have to ascend, the more rapidly does the distillation proceed; and so well are these principles understood by the Scotch distillers, that they do not take more than three minutes to draw off fifty gallons of wash.

The condensing apparatus used with the common still, is familiar to every one. The tube in which the head terminates, is inserted into the upper end of a pipe, which is kept cool by passing through a tub or other vessel filled with cold water, called the refrigeratory. The pipe, in common cases, is made of a serpentine form; but as this renders it difficult to be cleaned, Dr. Black recommends the use of a sigmoid pipe. The refrigeratory must be furnished with a stop-cock, that when the water it contains becomes hot, and does not condense all the vapour produced, it may be changed for cold water. From the lower end of the pipe, the distilled liquor drops into the vessel destined to receive it; and we should observe, that when any vapour issues along with it, it is necessary either to abate the fire, or else renew the water in the refrigeratory, otherwise there will be a loss of the product.

Distillation is variously employed, in pharmacy, to obtain the medical properties of vegetables, and other substances, in a liquid form.

DISTORTION, in surgery, is when any part of the human body remarkably deviates from its natural shape or position. Distortions of different parts may arise, either from an original defect in their formation, as in the *club-foot* in new born infants; from diseases, as in crookedness of the *spine*, &c. or it may result from some accident, by which a limb is broken or dislocated. See the articles Foot and Spine.

DITTANDER. See Nasturtium hortense.

DITTANY, BASTARD. See Dictamnus albus.

DITTANY OF CRETE. See Dictamnus creticus.

DITTANY, WHITE. See Dictamnus albus.

DIURESIS, (διυρησις; from δια, *through*, and ρεω, *to flow*); an increased secretion of urine. See Diabetes.

DIURETICA, (of the Greek, διυρητικα; from ουρησις, *a discharge of the urine)*, diuretics. Those medicines or substances are so called, which, when taken internally, augment the flow of urine from the kidneys. Dr. Cullen says, diuretics act either by increasing the quantity of water in the mass of blood; or else, that remaining the same, by introducing some sort of matter that may be a stimulus to the kidneys.

As when any quantity of water is taken, we commonly find the body, in the course of twenty-four hours, returning to the same weight that it was of before; so we may conclude, that the water thrown in, has passed out by the excretions of perspiration and urine; and in general it seems probable, that these excretions will be very much in proportion to the quantity of water for the time present in the mass of blood: wherefore, if the perspiration be determined, an increase of the water present in the blood will occasion an in-

crease of the secretion of urine, which accordingly commonly happens: and we commonly find, that an increase of the quantity of drink is attended with a proportional increase in the quantity of urine secreted.

" This therefore is the foundation of the first means we have assigned for promoting the secretion of urine. The quantity of water present in the mass of blood may be different from different circumstances; but the most part of these circumstances are hardly under the direction of our art: and the only one which is very much so, is the quantity of liquid taken into the body by drinking; which being therefore the chief means in our power of increasing the quantity of water in the blood, may be considered as a chief means of increasing the secretion of urine: and accordingly this increase of drink has always been considered as the chief of diuretics.

" There are, however, certain states of the body in which it may be doubtful if this means of increasing the secretion of urine may be safely employed. It sometimes happens, that the water of the blood, instead of passing off by the excretions, is effused into some of the cavities, and occasions the dropsy: and in such a case it may be suspected, that an increase of the water in the blood, made by an increase of drinking, may increase the effusion mentioned, and aggravate the disease. This suspicion has had such weight with some physicians as to lead them in such cases to enjoin as much as possible an abstinence from drinking; and it is alleged that such an abstinence has, in some cases, entirely cured the disease."

Dr. Cullen would not rigorously examine into the truth of this fact; but he is confident that it has been a very rare occurrence; and from the many known instances of its being attempted with very little benefit, he is not surprised that many physicians are decidedly of opinion, that it should never be attempted. It is an extremely painful measure, as it resists the urgent desire of drink which commonly attends this disease; and it may be alleged, that it is not always necessary, as the tendency to effusion may have its limits, so that the whole of the drink taken in, may be discharged this way, but still a portion of it may pass by the kidneys.

So far as this happens, the Dr. says, the drinking of liquids may be a safe measure; and he asserts, that in several cases of dropsy within his observation, the quantity of urine voided was nearly equal to the quantity of drink taken in; which shows that the permission to drink had been very properly given. He wonders, indeed, that the advocates for an abstinence from drinking have not thought of a means of determining how far this was to be carried; a point which certainly might be nearly determined by a comparison of the quantity of urine voided in a given time, with the quantity of drink taken in during the same time. He himself found, from making this comparison, that a very entire abstinence from drinking, by diminishing the quantity of urine voided, allowed the secretories of the kidneys to fall into a contracted state, so that the quantity of urine voided was still farther diminished, and, as he judged, tended to increase the effusion, and aggravate the disease. In other cases he found, when a quantity of drink was taken in, that a considerable portion of it passed by the kidneys; and when, as sometimes happened, that the quantity of urine voided was equal to the drink taken in, he concluded that the free use of drink was a thing perfectly fafe.

" To illustrate this matter farther," says, Dr. Cullen, " I must observe, that the water of the blood carrying the saline matters of it, by the nature of the animal economy is determined to the excretions, and particularly to the kidneys; and therefore, that drinks impregnated with saline matters are naturally determined this way rather than by the preternatural effusions mentioned. The fluid poured out by these effusions is nearly insipid; whilst, though the watery part of the blood is by these withdrawn from the secretories of the kidneys, yet a great quantity of the saline matter of the blood continues to pass this way: and I therefore have been led to give for drinks, not simple water, but always water impregnated with saline matters: and I can assert, that water so impregnated passes more certainly to the kidneys than perfectly insipid liquors.

" Thus water impregnated with vegetable acids is not only more grateful to the patient than simple barley-water, or water-gruel, but passes always in greater quantity in proportion to the liquid taken in; and it is commonly by attending to this that I have found, even in dropsy, the quantity of urine voided to be equal to the quantity of drink taken in."

In a word, whenever we can perceive that the quantity of urine voided is equal to the quantity of drink taken in within the same time, Dr. Cullen held it to be safe, to allow as much drink as the patient desired; and he says he has no doubt, that " *by such indulgence, the disease may be often entirely cured.*" There are indeed many instances of such a result upon record; as in the cases given by Sir George Baker in the Medical Transactions, with those related by Dr. Milman, and quoted from several authors of veracity. Dr. Cullen mentions one which accidently fell under his observation. " A woman labouring under an anasarca was accidently directed to drink a mineral water, and that in considerable quantity. By this her urine was greatly increased, and the anasarca was soon entirely cured." He considers it absurd indeed, in physicians, to employ diuretics, while they enjoin an

abstinence from fluids, the taking of which is almost the only means of conveying these diuretics to the kidneys. Whenever he employed diuretics, he at the same time advised drinking freely of liquids; and this, he is persuaded, often contributed to the patient's recovery.

Before Dr. Cullen proceeds to speak of the other means of promoting the secretion of urine that may be employed, he speaks thus of the chief effects of promoting this secretion.

"As it seems to be the purpose of nature," says he, "to carry out, by this secretion, the saline matters that, by the nature of the animal economy, are constantly generating in the mass of blood; so, by increasing the secretion, we carry out those saline matters, which, from certain causes, abound more than ordinary in the human body. Such a superabundance I suppose to take place in scurvy; and accordingly we find, that increasing the secretion of urine is the chief means of curing that disease.

"But as there are still other causes than those producing scurvy, which may increase the saline state of the fluids; so the increase of the secretion of urine may be a means of curing many diseases, though it is not easy to point out those in particular that may be so cured. Acrimony, or, what I judge to be the same thing, a saline state of the fluids, has been often assumed without evidence; and even in cases where it certainly existed, there are certain acrimonies which do not readily pass by the kidneys, and of course diseases depending upon them, which are not to be cured by increasing the secretion there.

"Hence it is that the increase of this secretion may not prove a remedy in so many cases as we might suppose it. On the other hand, it is to be observed, that as there is a balance between the perspiration and the secretion of urine, so that the one being increased the other is diminished; if there be a matter which nature has intended to pass especially by the perspiration, if this is retained by increasing the secrction of urine, diseases may be produced: and even if the increased secretion of urine should diminish the quantity of water which should pass by the skin, the saline matters which should pass that way by their being less diluted, may be more ready to lodge in the vessels of the skin, and thereby give occasion to diseases of it.

"Another effect of an increased secretion of urine may be considered as merely the evacuation of the water, or watry parts of the blood, which, when largely increased, may excite an absorption from the cavities, in which a preternatural accumulation of serous fluid had taken place. Thus it is that an increased secretion of urine has often proved a cure of dropsy: indeed, I doubt much, if any diuretic medicines can be very effectual without being accompanied with an increase of the water in the blood by taking in drink."

In speaking of particular diuretics, Dr. Cullen says, the diuretic vegetables mentioned by writers are of very little power, and are employed with very little success. Of the *Umbellatæ*, the medicinal power resides especially in their seeds, but he never found any of them very efficacious. The *semen dauci silvestris* has been commended as a diuretic; but its powers as such are not very remarkable. In like manner, some of the *plantæ stellatæ* have been commended as diuretics; but none of them deserve our notice, except the *rubia tinctorum*, the root of which passes so much by the kidneys as to give its colour to the urine. Hence it may be fairly supposed to stimulate the secretories: but Dr. Cullen found its diuretic powers did not always appear, at least never to any considerable degree; and as, in brute animals, it has always appeared hurtful to the system, he does not think it fit to be employed to any extent in human diseases. The *Bardana*, *Gramen*, *Lithospermum*, *Ononis*, *Asparagus*, *Enula Campana*, are all substances which seem to pass in some measure by the kidneys; but their diuretic powers are hardly worth notice.

The principal articles included by Dr. Cullen in his catalogue of diuretics, are *Dulcamara*, *Digitalis*, *Scilla*; some of the *Alliaciæ* and *Siliquosæ*; the *Balsams* and *Resins*; *Cantharides*, and the *Diuretic Salts*. See those articles.

DIVARICATION; the crossing of any two things. Thus, when the muscular or tendinous fibres intersect each other at different angles, they are said to divaricate.

DIVERTI'CULUM; a mal-formation or diseased appearance of an intestine, in which a portion of the intestine goes out of the regular course of the tube; and thereby forms a diverticulum, or deviation from the usual course, of the alimentary canal.

DIVERTI'CULUM NU'CKII; the opening through which the round ligaments of the uterus passes. Nuck, a celebrated anatomist, asserted that it remained open a long time after birth. To these openings he gave the name of *diverticula.*

DIVU'LSIO URI'NÆ, an irregular separation of urine, in which the sediment is divided, ragged, and uneven.

DIVISIBILITY, is that property of a body, whereby it is conceived to have parts, and into which it may actually or ideally be divided. All matter is infinitely divisible; yet this cannot be actually effected, because when any quantity is divided into any number of parts, every one of those parts is farther divisible into as many more parts, and so on; so that there can be no such thing as a determinate number of parts in any continued quantity.

DOCIMASTIC ART; the art of examining fossils, in order to discover what metals, &c. they contain. This properly belongs to chemistry.

DOCK-CRESSES. See Lamparna.

DOCK, SOUR. See Acetosa.

DOCK, WATER. See Hydrolapathum.

DODDER OF THYME. See Epithymum.

DODECADA'CTYLON, (δωδεκαδακτυλον, from δωδεκα, *twelve*, and δακτυλος, *fingers length)*; a name for the duodenum.

DODECA'NDRIA, (from the numerical term δωδεκα, *duodecim*, and ανηρ, *maritus)*, in the Linnæan system of botany, a class of plants, the eleventh in order, comprehending all those with hermaphrodite flowers, and twelve stamina in each. See Botany.

DO'DRANS, the seventh degree in the Linnæan scale for measuring the parts of plants: the space between the extremity of the thumb and that of the little finger when both extended; or nine Parisian inches.

DO'DRANS, a nine ounce measure; also a weight of ten ounces.

DOG-AND-DUCK WATER. See Epsom water.

DOG-ROSE. See Cynosbatus.

DOG'S BANE, SYRIAN; the *Asclepias Syriaca* of Linnæus. It is particularly poisonous to dogs, and also to the human species. Boiling appears to destroy the poison in the young shoots, which are then said to be esculent, and flavoured like asparagus.

DOG'S GRASS. See Granem caninum.

DOG'S MERCURY. See Cynocrambe.

DOG-STONES. See Satyrion.

DO'GMA, (δογμα; from δοκιω, *to be of opinion)*; an opinion founded on reason and experience.

DOGMATISTS, a sect of ancient physicians, of which Hippocrates was the first founder. They are also called *logici*, "logicians," from their using the rules of logic in subjects of their profession. They laid down definitions and divisions; reducing diseases to certain genera, and those genera to species, and furnishing remedies for them all; supposing principles, drawing conclusions, and applying those principles and conclusions to particular diseases under consideration: in which sense, the dogmatists stand contradistinguished from empirics and methodists. They rejected all medicinal virtues that they could not reduce to manifest qualities; but Galen has long ago observed of this sect, that they must either deny plain matter of fact, or assign but indifferent reasons and causes for many effects they pretend to explain.

DOLI'CHOS, (from δολιχος *long;* so called from its long shape), cowhage; *Dolichos pruriens; volubilis, leguminibus racemosis, valvulis subcarinatis hirsutis, pedunculis ternis*, Linn. Class, *Diadelphia*. Order, *Decandria*. The pods of this plant are covered with sharp hairs, which are the parts employed medicinally, in the form of an electuary, as anthelmintics. See Anthelmintica.

DOLI'CHOS SO'JA; the plant which affords the Indian kidney bean. It is much cultivated in Japan, where it is called *daidsu*, and where the pods supply their kitchens for various purposes; but the two principal preparations of them are, with a sort of butter, termed *miso*, and a pickle called *sooju*.

DOLI'CHOS PRU'RIENS; the systematic name of the cowhage. See Dolichos.

DO'LOR FACIE'I. See Tic douloureux.

DOLOUREUX TIC, also named *dolor faciei;* a painful spasmodic, or nervous, disease, which attacks the face. It consists in a chronic fixed pain, which has paroxysms of acute pain, and, during its presence, gives violent lancinating twitches, like the ticking of a clock. The seat of this affection is mostly in the branches of the facial nerve, and the fifth pair; though it is apt to occur in other parts of the body also. See Tic douloureux.

DORO'NICUM, (*Doronicum*, Arab.) the herb leopard's bane. See Arnica.

DORSA'LES. The nerves which pass out from the vertebræ of the back are thus named.

DO'RSI SPINA'LIS. See Spinalis dorsi.

DORSUM, (most etymologists say, from *deorsum*, because it bends downwards); the back. It is the hinder part of the thorax, though, as translated *back*, it includes the loins also. *Dorsum manûs* and *pedis* is the outside of the hand and foot. Hence *dorsale* is applied to diseases, whose seat is supposed in the back, as the *Tabes Dorsalis*, and to external remedies formerly, as *Emplastrum Dorsale*, &c.

DORSAL-VERTEBRÆ. See Bones and vertebræ.

DORSTE'NIA, (so named in honour of Dr. Dorsten); a name for the *Contrayerva*.

DORSTE'NIA DRA'KENA; the systematic name of the contrayerva. See Contrayerva.

DORSTENIA HOUSTONII. See Contrayerva.

DOSE, (from δοσις, *any thing given)*, a quantity of medicine directed to be swallowed by the patient; or so much of any remedy as is administered at one time. See Posological table.

DOVE'S-FOOT. See Geranium columbinum.

DRACHM, (δραχμα), among the Greeks was the name of a coin; also of a weight, which the divided into six *oboli*. In medicine it is the eighth part of an ounce, in prescription marked ʒj, and contains three scruples, or sixty grains.

DRA'CO SYLVE'STRIS. See Ptarmica.

DRACOCE'PHALUM CANARIE'NSE; the systematic name of the balsam of Gilead. See Moldavica.

DRACO'NIS SA'NGUIS. See Sanguis draconis.

DRACO'NTIUM, (δρακοντιον; from δρακων, *a dragon:* so called, because its roots resemble a

dragon's tail), *dracontium, sive serpentaria;* DRAGON'S WORT. This plant is the *Arum dracunculus*, Linn. Its roots and leaves are acrimonious; much more so than the *arum maculatum*, with which it mostly agrees in medicinal virtues.

DRACU'NCULUS. See GUINEA-WORM.

DRAGACA'NTHA. See TRACACANTHA.

DRA'GANT, GUM. See TRAGACANTHA.

DRAGONS. See DRACONTIUM.

DRAGON'S BLOOD. See SANGUIS DRACONIS.

DRAK'ENA. See CONTRAYERVA.

DRASTICA, (of the Gr. δραστικος, *active*, or *brisk;* from δραω, *to effect);* a term generally applied to those medicines which are very violent in their action on the bowels; thus, we have drastic purges, emetics, &c.

DROPSY, *(hydrops*, from υδωρ, *water).* See ASCITES and ANASARCA.

DROPWORT. See ŒNANTHE and FILIPENDULA.

DROPWORT, HEMLOCK. See ŒNANTHE.

DROPWORT, WATER. See ŒNANTHE.

DRO'SERA, (from δροσερος, *dewy*, which is from δροσος, *dew;* drops hanging on the leaves like dew); the plant called SUN-DEW.

DRO'SERA ROTUNDIFO'LIA; the systematic name of the sun-dew. See ROS SOLIS.

DRU'PA, in botany, a fleshy or pulpy pericarpinm without valve, containing a stone, as the plum, peach, &c.

DRUPA'CEÆ, (from *drupa)*, an order of plants in the *Fragmenta Methodi Naturalis* of Linnæus, containing these genera, viz. *Amygdalus, Prunus, Cerasus, Padus.*

DRUNKENNESS, a well-known affection of the brain, occasioned by drinking too freely of intoxicating liquors. Drunkenness appears in different shapes in different constitutions: some it makes gay, some sullen, and some furious. Persons addicted to excessive drinking, suffer, in the intervals of sobriety, and near the return of their accustomed indulgence, a faintness and oppression about the *præcordia* which it exceeds the ordinary patience of human nature to endure. This is usually relieved, for a short time, by a repetition of the same excess; and to this relief, as to the removal of every long continued pain, they who have once experienced it are urged almost beyond the power of resistance. This is not all: as the liquor loses its stimulus, the dose must be increased, to reach the same pitch of elevation or ease; which increase, proportionably accelerates the progress of all the maladies that drunkenness brings on. Whoever reflects, therefore, upon the violence of the craving in advanced stages of the habit, and the fatal termination to which the gratification of it leads, will, the moment he perceives the least tendency in himself of a growing inclination to intemperance, collect his resolution to this point; or (what perhaps he will find his best security) arm himself with some peremptory rule, as to the times and quantity of his indulgences. Dyspepsia, Apoplexy, Dropsy, Palsy, and many other maladies, are the consequences of this lamentable vice.

DUCTILITY, in physics, a property by which bodies are dilated by repeated or continued pressure. It is peculiar to metals, of which gold is the most remarkable.

DUCTS, BILIARY. See BILIARY DUCTS.

DU'CTUS AD NA'SUM. See CANALIS NASALIS.

DU'CTUS COMMU'NIS CHOLE'DOCHUS. See CHOLEDOCHUS DUCTUS.

DU'CTUS HEPA'TICUS. See HEPATIC DUCT.

DU'CTUS LACHRYMA'LIS. See LACHRYMAL DUCTS.

DU'CTUS LACTI'FERI, called also *ductus galactoferi;* the excretory ducts of the glandular substance composing the female breast. The milk passes along these ducts to the nipple. See MAMMA.

DU'CTUS PANCREA'TICUS; the pancreatic duct. It is white and small, and arises from the sharp extremity of the pancreas, running through the middle of the gland, towards the duodenum, into which it pours its contents by an opening common to itself and the *ductus communis choledochus.* See PANCREAS.

DU'CTUS SALIVA'LES; the excretory ducts of the salivary glands, which convey the saliva into the mouth. See SALIVA, and SALIVAL GLANDS.

DU'CTUS STENO'NIS, the Stenonian duct; so called after its discoverer. It arises from all the small excretory ducts of the parotid gland. It passes transversely over the masseter muscle, penetrates the buccinator, and opens into the mouth.

DU'CTUS WARTHONIA'NUS, the excretory duct of the maxillary glands; so named after its discoverer.

DUMBNESS, the privation of the faculty of speech. The most general, and frequently the sole cause of dumbness, is the want of the sense of hearing (see DEAFNESS); language being originally acquired by imitating articulate sounds. From this source of intelligence, deaf people are entirely excluded: they cannot acquire articulate sounds by the ear; unless, therefore, articulation be communicated to them by some other medium, these unhappy people must for ever be deprived of the use of language; and as language is the principal source of knowledge, whoever has the misfortune to want the sense of hearing, must remain in a state little superior to that of the brute creation. Of late years, however, it has been shown, that although deaf people cannot learn to speak or read by the direction of the ear, there are other sources

of imitation, by which the same effect may be produced. The organs of hearing and of speech have little or no connexion. Persons deprived of the former generally possess the latter in such perfection, that nothing further is necessary, in order to make them articulate, than to teach them how to use these organs. This indeed is no easy task; but the regular seminaries kept near the metropolis, by Mr. Braidwood and Mr. Telfair, as well as the charitable institution at Bermondsey, in which the instruction of deaf and dumb persons is successfully conducted, show that it is certainly practicable. The former began with a single pupil in 1764; and since that period has taught great numbers to speak so as to be understood, to read, to write, to understand figures, the principles of religion and morality, &c.

In the German Ephemerides is an account of an innkeeper's son affected with a periodical dumbness, which had continued for 15 years. The loss of speech was at first instantaneous, and continued only a few minutes: but the duration of it began to lengthen every day; so that it soon amounted to half an hour, two hours, three hours, and at last to 93 hours, yet without any order. At last the return of speech kept so constant and regular an order, that, for 14 years together, he could not speak except from noon, during the space of one entire hour, to the precise moment of one o'clock. Every time he lost his speech, he felt a sense of something rising from his stomach to his throat, but in other respects was in good health. Both his internal and external senses also continued sound: he heard always perfectly well, and answered the questions proposed to him, by gestures or in writing. The account states, that all suspicion of imposture was removed, by his keeping exactly the same hour, though he had no access to any instruments by which time can be measured.

DU'MUS, in botany, a bush. Bushes send out branches from near their roots; and hence are distinguished from trees, whose stem rises considerably before any branches are sent out.

DUNG, DEVIL'S. See ASSAFÆTIDA.

DUODE'NUM, (from *duodenus*, consisting of twelve: so called, because it was supposed not to exceed the breadth of twelve fingers; but as the ancients dissected only brute animals, this does not hold good in the human subject), the first portion of the small intestines. This intestine having arisen from the pylorus, is immediately bent a little backward and obliquely downward; then it bends a second time toward the right kidney, to which it is a little connected; and from thence passes before the renal artery and vein, ascending insensibly from right to left, till it gets before the aorta, and last vertebræ of the back. It continues its course obliquely forward by a gentle turn, which may be reckoned a third incurvation, and also the extremity of the duodenum.

Through this whole course the duodenum is firmly bound down by the folds of the peritonæum, especially by a transverse duplicature which gives origin to the mesocolon. The two laminæ of this duplicature being at first separate, and soon afterward uniting, must leave a triangular space between them, which is lined with a cellular substance. It is in this space that the duodenum adheres, by means of the cellular substance, to the parts already named; and the intestine is contained therein, as in a case; so that, without dissection, we can see nothing but its two extremities; and even these are hidden by the colon, and by the first convolutions of the jejunum.

The first coat of the duodenum is consequently different from that of the other small intestines, having this peculiar to it, that it does not invest the whole circumference of the intestine; because, through the greatest part of the length, it lies in the triangular space already mentioned; and, for the same reason, there is a greater quantity of cellular substance belongs to the outer coat of the duodenum than to that of the other intestines. The muscular coat of the duodenum is thicker than in the jejunum and ileum. The tunica nervosa and villosa form, conjointly, on the insides of this intestine, a great number of small duplicatures, which advance into the cavity more or less directly, like portions of circular planes, with one edge fixed to the intestine, and the other loose. These are the *valvulæ conniventes*. The loose edge of these valves is formed into small plaits or waves in the natural state; their whole surface being villous, as well as that of the intestine between them.

The villi of this intestine are thicker than in the stomach; but the texture of them in man is not like hairs, as they are commonly represented in figures, but rather like that of a fungous granulated substance, composed of an infinite number of very fine papillæ of different figures; in which we see, through a microscope, a multitude of depressed points or pores, by which their whole surface seems to be pierced. By the same means we observe, on different places of the inner surface of this intestine, several round villous tubercles, rising like small verrucæ, at different distances from each other.

This substance sustains an infinite number of capillary vessels of different kinds; for, besides the blood-vessels, we sometimes observe a great number of white filaments which run through it, and end at its inner surface like so many capillary roots of the lacteal vessels. When the villous substance is examined in the microscope, besides the blood-vessels, numerous follicles are observed lodged in cellular substance. These have been considered as the origin of the lacteal vessels, and have been called *ampullulæ of Leiberkuhn*, because first discovered by that anatomist.

The fungous substance which binds together and

incloses these capillary filaments, is very tender; and the capillary extremities of the small blood-vessels distributed through it, seem to be turned toward the pores of the papillæ. Through these pores a mucous fluid, more or less transparent, is discharged, which continually moistens the cavity of the intestine.

The internal surface of this intestine is furnished with a great number of small flat glandular tubercles, named after *Brunner*, which are raised on the sides, and depressed in the middle, by a kind of fossula; and they are more numerous near the beginning of this intestine than any where else. About the pylorus they lie as it were in heaps or clusters; and from thence the distance between them increases gradually all the way to the other extremity, where they are single. These glands, when examined carefully, appear like little bladders, with the orifices turned towards the cavity of the intestine, and the bodies fixed in the spongy substance next the nervous coat. They furnish a particular fluid, which is often found to be of a viscid consistence.

In the inner surface of the duodenum, almost at the lower part of the first incurvation, and on the shortest side, there is a longitudinal eminence, in the point or apex of which lies a particular opening, which is the orifice of the *ductus biliarius*, and within this, the *ductus pancreaticus* likewise opens.

This intestine has been called by some authors *ventriculus succenturiatus*. It is commonly the widest, though the shortest, of the small intestines, and is invested with more cellular substance, especially while within its triangular case, where it wants the outer coat which the others have; and consequently it is more easily dilatable by the substances which might otherwise be detained within it.

DU'RA MA'TER, (from *durus*, hard, and *mater*, a mother: called *dura*, from its comparative hardness with the *pia mater;* and *mater*, from its being supposed to be the source of all the other membranes), also called *Dura meninx* and *Dermatodes;* a thick membrane that incloses the brain and all its appendages, lines the inside of the cranium, and supplies the place of an internal periosteum; being spread in the depressions, and covering all the eminences, in such a manner as to prevent their being hurtful to the brain.

The dura mater is composed of one lamina; although it may, by maceration, be divided into two or more. Its texture is very close and strong, appearing to be partly ligamentous and partly tendinous. It is attached closely to the cranium by a great number of filaments of the external surface, which enter the pores of the bones, almost every where, but more particularly at the sutures both above and below; and by penetrating these, they communicate with the external periosteum. The connecting filaments are, for the most part, small vessels; which, being broken in separating the dura mater from the skull, a great number of red points appear on the external surface of that membrane. The adhesion of this membrane to the inner surface of the cranium is stronger in children and young persons, than in those of an advanced age: the filaments become then very small, being compressed by the contraction of the bony pores; consequently they are more easily ruptured by any force applied to them. The inner surface of the dura mater is very smooth and polished, and also continually moistened by a fine fluid, discharged through its pores, much in the same manner as the peritonæum and pleura.

The dura mater sends off several processes; three of which form particular septa that divide the brain. One of them is superior, forming a kind of mediastinum between the two great lobes of the brain. The second is in a middle situation, like a diaphragm, between the cerebrum and cerebellum; the third is inferior, between the lobes of the cerebellum. The superior septum is longitudinal in form of a scythe, whence it is termed the *falx of the dura mater.* The middle septum is transverse; and is called *tentorium cerebelli.* The inferior septum is very small, and runs down between the lobes of the cerebellum; on which account it may be termed either simply *septum cerebelli*, or *septum occipitale minus*, the middle partition being reckoned the septum occipitale majus.

The superior or vertical septum, called the *falx of the dura mater*, is a long and broad fold or duplicature of the internal part, reaching from the edge of the crista ossis cribrosi, along the sagittal suture, to the middle of the transverse septum; which it joins in such a manner, as that the lateral laminæ of the falx are continuous, on each side, with the neighbouring portions of the superior lamina of the middle septum. Where it joins the middle septum it is broader than at the os ethmoides; and it is thicker at that edge which adheres to the cranium, than at the other, which is very sharp.

The transverse or middle septum, called *tentorium cerebelli*, is fixed to the os occipitis along the grooves of the lateral sinuses, and those of the great angles of the apophyses petrosæ all the way to the posterior clinoid apophyses of the sphenoidal bone. Thus it forms a sort of shallow vault, on the forepart of which is a large notch almost of an oval figure. This septum divides the cranium into two cavities, one large or superior, and the other small or inferior, which communicate together by the great oval notch. It is formed by a particular fold consisting of a broad portion of the internal part of the dura mater; and in the natural state it is very tense, because of its union or rather continuity with the falx. This union of the two septa

keeps them both very tense, so that the middle septum is capable of sustaining a considerable weight; and the falx is able to resist lateral pressure, without giving way to either side.

The small *occipital septum*, which is very short and narrow, runs down from the middle of the transverse septum, to the edge of the great occipital hole, being fixed to the internal spine of the os occipitis. It is formed by a duplicature of the internal part of the dura mater, in the same manner as the other two, and distinguishes the lower part of the occipital cavity of the cranium into two lateral parts. In some subjects this septum is double.

Besides these large folds, there are two small lateral ones on each side of the sella turcica, each running from the posterior to the anterior clinoid apophysis on the same side. These two folds, together with the anterior or posterior parts of the sella turcica, form a fossula, within which the pituitary gland is lodged. There are likewise two anterior folds at the edges of the sphenoidal or superior orbitary fissures, which augment the depth of the middle fossulæ of the basis cranii. Thus we have seven folds of this membrane, three large and four small, which may be termed *internal productions* or *processes of the dura mater*.

The *elongations of the dura mater* go beyond the general circumference, and pass out of the cranium, through the openings of the cranium. These may be named, not improperly, *external productions of the dura mater*. The most considerable of these passes through the great occipital foramen, and runs down the common canal of the vertebræ, in form of a tube, lining the inside of that canal, and inclosing the medulla spinalis; having the name of its *dura mater*. The other elongations accompany the nerves out of the cranium in the form of vaginæ, which are more numerous than the nervous trunks reckoned in pairs. For the olfactory nerves, there is the same number of distinct vaginæ as there are holes in the ethmoidal bone; and some nerves are accompanied by several vaginæ through one hole, as happens in the ninth pair.

There are two particular elongations which line the orbits, and form the vaginæ of the optic nerves. These orbitary elongations go out by the superior orbitary fissures, or foramina lacera of the sphenoid bone; and, increasing in breadth in their passage, line the whole cavity of the orbits, at the edges of which they communicate with the pericranium and periosteum of the face. They communicate likewise, through the spheno-maxillary or inferior orbitary fissures, with the pericranium of the temporal and zygomatic fossæ. These communications explain the accidents which happen to these parts in wounds of the scalp. The elongations of the dura mater which accompany the blood-vessels through the foramina of the cranium, unite with the pericranium immediately afterwards. Such, for instance, are the elongations which line the fossulæ of the foramina lacera or jugularia, and the bony or carotid canals of the apophysis petrosa, &c.

In its duplicature the dura mater contains several canals, into which the venous blood, not only of itself, but of the whole brain, is carried. These are termed *sinuses;* and some of them are disposed in pairs, others in uneven numbers; that is, some of them are placed alone in a middle situation; others are disposed laterally on each side of the brain. Ancient anatomists reckoned only four; but we now add several others. These sinuses are in the duplicature of the dura mater; and their cavities are lined on the inside by fine membranes. They are: 1. The *superior longitudinal sinus*, or *falx*, reckoned the first by the ancients. 2. Two *great lateral sinuses*, the second and third of the ancients. 3. The sinus called *torcular Herophili*, the fourth of the ancients. 4. The small sinus of the falx, or *inferior longitudinal sinus*. 5. The *posterior occipital sinus*, which is sometimes double. There are besides, *four sinus petrosi*, two on each side, one superior, and one inferior; *two transverse occipital sinuses;* the *circular sinus* of the sella sphenoidalis; two *sinus cavernosi*, one on each side; and lastly, the two *orbitary sinuses*, one on each side.

These sinuses communicate with each other, and with the great lateral sinuses, by which they discharge themselves into the internal jugular veins, they being only continuations of the lateral sinuses. They likewise empty themselves, partly into the vertebral veins, which communicate with the small lateral or inferior occipital sinuses; and partly into the external jugular veins, by the orbitary sinuses, which communicate with others. Thus the blood, which is carried to the dura mater, &c. by the external and internal carotid, and by the vertebral arteries, is returned to the heart by the external and internal jugular and vertebral veins; so that, when the passage of the blood is any where obstructed, it finds another way by these communications.

The *great sinus* of the falx reaches from the connexion of the ethmoidal crista with the os frontis, along the upper edge of the falx, all the way to the posterior edge of the transverse septum, and there it ends by a bifurcation in the great lateral sinuses. It is very narrow at its anterior extremity, and from thence becomes gradually wider all the way to its posterior extremity. The cavity of this sinus is triangular, having three sides; one superior, parallel to the cranium; and two lateral, inclined to the plane of the falx. The upper side is formed by the external surface of the dura mater: and through the middle of its breadth, a kind

of fine *raphe*, or suture, runs from one end to the other. The two lateral sinuses, are productions of the inner surface of the dura mater; which having parted from the external, are inclined toward each other, and then unite; forming first the sinus, and afterwards the duplicature of the falx. This sinus is lined interiorly by a fine proper membrane, which forms likewise a kind of raphe, or suture, along its bottom, that is, along the union of the two lateral sides.

In this sinus are many openings and several ligamentary fræna. The former are orifices of veins; the smallest of which belong to the dura mater, the largest to the brain. The veins of the brain enter the sinus, for the most part obliquely, from behind forward, after they have run about a finger's breadth, in the duplicature of the dura mater. The internal fræna of this great sinus appear to be tendinous, and probably designed to prevent its too great dilatation by the motion of the blood. They vary, however, in different subjects, and do not always reach from one side to the other. It has been pretended, that glands have been found there; but these, in fact, are only certain small corpuscles, having very little of the nature of glands.

We find the *inferior sinus* of the falx in the lower edge of its duplicature. It is very narrow, and, as it were, flatted on both sides. It communicates immediately with the fourth sinus of the ancients; and in some subjects, seems even to be only a continuation. It likewise communicates with the great or superior sinus, by small veins, which go from one to the other; and with the veins of the cerebrum by the same means.

The *lateral sinuses* seem to be two large branches of the superior longitudinal sinus, one going to the right hand, the other to the left, along the great circumference of the transverse septum, all the way to the basis of the apophysis petrosa of the temporal bones. From thence they run down, having first taken a large turn, and then a small one; and being strongly fixed in the lateral grooves of the basis cranii, they follow the course thereof, all the way to the foramina lacera, and fossulæ of the jugular veins. They do not always arise by an equal bifurcation of the superior longitudinal sinus; for, in some subjects, one of the lateral sinuses appears to be a continuation of the longitudinal, and the other to be a branch from it. We also sometimes find one of these sinuses higher or lower, larger or smaller, than the other. The cavity of these lateral sinuses is likewise triangular, and furnished with its proper membrane, and with fræna: and it has also the small venal openings; which indeed are common to it, not only with the longitudinal sinus, but with most part of the others. The posterior or outer side of this cavity, is formed by the external, and the other two by the internal, part of the dura mater. As these two sinuses go out by the posterior portions of the openings of the basis of the skull, called *foramina lacera,* they are dilated into a kind of bag, proportioned to the fossulæ of the jugular veins, where they terminate in the latter.

Near the concourse of the superior longitudinal and lateral sinuses, there occurs an opening (sometimes double), which is the orifice of a sinus situated along the union of the falx and transverse septum. It does not always end directly at the lower part of the superior sinus, but sometimes opens at the beginning of one of the lateral sinuses, especially when the bifurcation is not equal; and in this case it often terminates in that lateral sinus, which appears like a branch from the common trunk of the superior and other lateral sinus. This sinus has been named *torcular Herophili*, from an ancient author, who imagined that the blood was, as it were, in a press, at the union of these four sinuses. Its diameter is inconsiderable; and its form a kind of bifurcation with the inferior longitudinal sinus, and with a vein of the cerebrum, called *vena magna Galeni.*

The *cavernous sinuses* of the os sphenoides, are reservatories of a very particular kind; containing not only blood, but considerable vessels and nerves; and likewise a cavernous substance full of blood, much like that of the corpus cavernosum urethræ.

The small tubercles found on the lateral parts of the longitudinal sinus of the falx, and contiguous parts of the brain, have been called *glands* by Pacchioni, and, if they really are such, which however remains yet to be demonstrated, seem to belong rather to the conglomerate than to the conglobate kind. The whole inside of the dura mater is moistened by exhalent vessels in the same manner as the peritonæum and pleura.

The prominent fibres that intersect each other in different ways, and which appear on the inside of the dura mater, especially near the falx and transverse septum, seem to be only of a ligamentary and elastic texture. The universal adhesion of the dura mater to the cranium, proves that it can have no motion, and consequently that *muscular* fibres would be altogether useless in this part of the animal economy.

DU'RA ME'NINX. See Dura Mater.

DWALE. See Belladonna.

DWARF, an appellation given to those unfortunate persons who are greatly inferior in size to that which is usual in the rest of mankind. The Romans were passionately fond of dwarfs, whom they called *nani* or *nanæ;* insomuch that they often used artificial methods to prevent the growth of boys designed for dwarfs, by inclosing them in boxes, or by the use of tight bandages. Augustus's niece, Julia, was extremely fond of a dwarf called *Sonopas*, who was only two feet and a hand's-breadth high. We have many other accounts of

human dwarfs, but most of them were deformed, in some way or other, besides being remarkable for the smallness of their size. Many relations concerning dwarfs we must necessarily look upon as fabulous, but the history of Jeffery Hudson, the famous English dwarf. is looked upon as authentic. He was born at Oakham in Rutlandshire in 1619; and about the age of seven or eight, being then but eighteen inches high, was retained in the service of the duke of Buckingham, who resided at Burleigh on the Hill. Soon after the marriage of Charles I. the king and queen being entertained at Burleigh, little Jeffery was served up to table in a cold pye, and presented by the duchess to the queen, who kept him as her dwarf. From seven years of age, till thirty, he never grew taller; but after thirty he shot up to three feet nine inches, and there fixed. Jeffery became a considerable part of the entertainment of the court; and Sir William Davenant wrote a Poem called "*Jeffreidos*," on a battle between him and a turkey-cock. In the Memoirs of the Royal Academy of Sciences, a relation is given, by the Count de Tressau, of a dwarf called *Bebe*, kept by the late Stanislaus king of Poland, and who died in 1764 at the age of twenty-three, when he measured only thirty-three inches. At the time of his birth, he measured only between eight and nine inches. Diminutive as were his dimensions, his reasoning faculties were not less scanty; appearing indeed not to have been superior to those of a well-taught pointer. But that the size and strength of the intellectual powers are not affected by the diminutiveness or tenuity of the corporeal organs, is evident from a still more striking instance of littleness, given us by the same nobleman, in the person of Monsieur Borulawski, a Polish gentleman whom he saw at Luneville, who has since been at Paris and lately in London, and who, at the age of twenty-two, measured only twenty-eight inches. This miniature of a man, considering him only as to his bodily dimensions, was a giant with regard to his mental powers and attainments. He is described by the count as possessing all the graces of wit, united with a sound judgment and an excellent memory; so that we may with justice say of M. Borulawski, in the words of Seneca, and nearly in the order in which he has used them, "*Posse ingenium fortissimum ac beatissimum sub quolibet corpusculo latere.*"

DWARF ELDER. See Ebulus.

DYSÆTHE'SIÆ, (of the Greek, δυσαισθησια; from δυς, *difficultly*, and αισθανομαι, to *feel* or *perceive*); the senses injured or destroyed by the imperfections of the organs. It is an order in the class *locales* of Cullen's nosological arrangement. See Nosology.

DYSCINE'SIÆ, (δυσκινησια; from δυς, *bad*, and κινεω, to *move*); motion impeded, or depraved, from an imperfection of the organ. It is an order in the class *locales* of Cullen's nosology. See Nosology.

DYSECŒ'A, (δυσηκοια; from δυς, *difficult*, and ακοη, *hearing*); the hearing diminished or destroyed. It is a genus of disease in the class *locales* and order *dysæsthesiæ*, of Cullen, containing two species: 1. *Dysecœa organica*, which arises from wax in the meatus, injuries of the membrane, or inflammation and obstruction of the tube: 2. *Dysecœa atonica*, when without any discernible injury of the organ. See Deafness.

DYSENTE'RIA, (δυσεντερια; from δυς, *difficulty*, and εντερα, *the bowels*), a dysentery, or flux; a genus of disease in the clas *pyrexiæ*, and order *profluvia*, of Dr. Cullen's Nosology.

In this disease, the patient has frequent stools, accompanied with much griping, and followed by a tenesmus. The stools, though frequent, are generally in small quantity; and the matter voided is chiefly mucus, sometimes mixed with blood. At the same time the natural fæces seldom appear, and when they do, it is generally in a compact and hardened form, often under the form of small hard substances, known by the name of *scybala*. This disease occurs especially in summer and autumn, at the same time with autumnal intermittent and remittent fevers; and with these it is often complicated. It comes on sometimes with cold shiverings, and other symptoms of pyrexia; but more commonly the symptoms of the topical affection appear first. The belly is costive, with an unusual flatulence in the bowels. Sometimes, though more rarely, some degree of diarrhœa is the first appearance. In most cases the disease begins with griping, and a frequent inclination to go to stool. In indulging this, little is voided, but some tenesmus attends it. By degrees the stools become more frequent, the griping more severe, and the tenesmus more urgent. With these symptoms there is a loss of appetite; and frequently, sickness, nausea, and vomiting, also affect the patient. At the same time there is always more or less of pyrexia present. It is sometimes of the remittent kind, and observes a tertian period. Sometimes the pyrexia is manifestly inflammatory, and very often of a putrid kind. These febrile states continue to accompany the disease during its whole course, especially when it terminates soon in a fatal manner. In other cases, the febrile state almost entirely disappears, while the proper dysenteric symptoms remain for a long time after. In the course of the disease, whether for a shorter or a longer time, the matter voided by stool is very various. Sometimes it is merely a mucous matter without any blood, exhibiting that disease which is named, by some, the *morbus mucosus*, and by others the *dysenteria alba*. For the most part, however, the mucus discharged is more or less mixed with blood. This sometimes appears only in streaks among the mucus; but at other times is more copious, giving a tinct to the whole; and upon some occasions, a pure and unmixed blood is voided in

considerable quantity. In other respects, the matter voided is variously changed in colour and consistence, and is commonly of a strong and unusually fœtid odour. It is probable, that sometimes a genuine pus is voided, and frequently a putrid sanies, proceeding from gangrenous parts. There are very often, mixed with the liquid matter, some films of a membranous appearance, and frequently some small masses of a seemingly sebaceous matter. While the stools, voiding these various matters, are, in many instances, exceedingly frequent, it is seldom that natural fæces appear in them; and when they do appear, it is, as we have said, in the form of scybala, that is, in somewhat hardened, separate balls. When these are voided, whether by the efforts of nature or as solicited by art, they procure a remission of all the symptoms, and more especially of the frequent stools, griping, and tenesmus.

Accompanied with these circumstances, the disease proceeds for a longer or a shorter time. When the pyrexia attending it is of a violent inflammatory kind, and more especially when it is of a very putrid nature, the disease often terminates fatally in a very few days, with all the marks of a supervening gangrene. When the febrile state is more moderate, or disappears altogether, the disease is often protracted for weeks, and even for months; but, even then, after a various duration, it often terminates fatally, and generally in consequence of a return and considerable aggravation of the inflammatory and putrid states. In some cases the disease ceases spontaneously; the frequency of stools, the griping, and tenesmus, gradually diminishing, while natural stools return. In other cases, the disease, with moderate symptoms, continues long, and ends in a diarrhœa, sometimes accompanied with lienteric symptoms.

The remote causes of this disease have been variously judged of. It generally arises in summer or autumn, after considerable heats have prevailed for some time, and especially after very warm, and at the same time very dry, states of the weather; and the disease is much more frequent in warm than in cooler climates. It happens, therefore, in the same circumstances and seasons which considerably affect the state of the bile in the human body: but the cholera is often without any dysenteric symptoms, and copious discharges of bile have been found to relieve the symptoms of dysentery; so that it is difficult to determine what connexion the disease has with the state of the bile.

It has been observed, that the effluvia from very putrid animal substances readily affect the alimentary canal, and, upon occasion, they certainly produce a diarrhœa; but whether they ever produce a genuine dysentery, is not certain.

The dysentery does often manifestly arise from the application of cold, but the disease is always contagious; and, by the propagation of such contagion, independent of cold, or other exciting causes, it becomes epidemic in camps and other places. It is, therefore, to be doubted, if the application of cold ever produces the disease, unless where the specific contagion has been previously received into the body; and, upon the whole, it is probable, that a specific contagion is to be considered as being always the remote cause of the disease.

Whether this contagion, like many others, be of a permanent nature, and only shows its effects in certain circumstances which render it active, or if it be occasionally produced, we cannot determine. Neither, if the latter supposition be received, can we say by what means it may be generated. As little do we know any thing of its nature, considered in itself; or at most only this, that, in common with many other contagions, it is very often somewhat of a putrid nature, and capable of inducing a putrescent tendency in the human body. This, however, does not at all explain the peculiar effect of inducing those symptoms which properly and essentially constitute dysentery. Of these symptoms the proximate cause is still obscure. The common opinion has been, that the disease depends upon an acrid matter, thrown upon, or somehow generated in, the intestines; exciting their peristaltic motion, and thereby producing the frequent stools which occur in this disease. But this supposition cannot be adopted; for, in all the instances known, of acrid substances applied to the intestines, and producing frequent stools, they at the same time produce copious stools, as might be expected from acrid substances applied to any length of the intestines. This, however, is not the case in dysentery, in which the stools, however frequent, are generally in very small quantity, and such as may be supposed to proceed from the lower parts of the rectum only. With respect to the superior portions of the intestines, and particularly those of the colon, it is probable they are under a preternatural and considerable degree of constriction: for, as we have said above, the natural fæces are seldom voided; and when they are, it is in a form which gives reason to suppose they have been long retained in the cells of the colon, and consequently that the colon had been affected with a preternatural constriction. This is confirmed by almost all the dissections which have been made of the bodies of dysenteric patients; in which, when gangrene had not entirely destroyed the texture and form of the parts, large portions of the great guts have been found affected with a very considerable constriction.

The proximate cause of dysentery, or at least the chief part of the proximate cause, seems to consist in a preternatural constriction of the colon, occasioning, at the same time, those spasmodic efforts which are felt in severe gripings, and which efforts, propagated downwards to the rectum, occasion there the frequent mucous stools and tenes-

mus. But whether this explanation shall be admitted or not, it will still remain certain, that hardened fæces, retained in the colon, are the causes of the griping, frequent stools, and tenesmus; for the evacuation of these fæces, whether by nature or by art, gives relief from the symptoms mentioned; and it will be more fully and usefully confirmed by this, that the most immediate and successful cure of dysentery is obtained by an early and constant attention to the preventing the constriction, and the frequent stagnation of fæces in the colon.

During the early periods of this disease, the objects chiefly to be aimed at in the cure, are the following: the discharge of acrid matter deposited in the alimentary canal; the counteracting the influence of this matter when it cannot be evacuated; the obviating the effects resulting from such acrid matter as can neither be evacuated nor destroyed; and, finally, the prevention of any further separation and disposition of such matter in the alimentary canal. In the more advanced periods of the disease, the principal objects are, the giving a proper defence to the intestines against irritating causes; the diminution of morbid sensibility of the intestinal canal; and the restoration of due vigour to the system in general, but to the intestines in particular.

The most eminent of our late practitioners, and of greatest experience in this disease, seem to be of opinion, that it is to be cured most effectually by purging, assiduously employed. The means may be various, but the most gentle laxatives are usually sufficient; and, as the medicine must be frequently repeated, these are the most safe, more especially as an inflammatory state so frequently accompanies the disease. Whatever laxatives produce an evacuation of natural fæces, and a consequent remission of the symptoms, will be sufficient to effectuate the cure. But if the gentle laxatives shall not produce the evacuations now mentioned, somewhat more powerful must be employed; and Dr. Cullen found nothing more proper or convenient than tartarised antimony, given in small doses, and at such intervals as may determine its operation to be chiefly by stool. An antimonial, at one time considered as an almost infallible remedy for this disease, is the *oxidum antimonii vitrificatum cum cera*, or *vitrum antimonii ceratum*, as it was formerly called, but it is exceptionable from the uncertainty and violence of its operation; and perhaps the safest and best purgatives are the neutral salts, particularly those containing fossil alkali, such as the *soda vitriolata*, *tartarisata*, or *phosphorata*. Rhubarb, so frequently employed, is, he thinks, in several respects, amongst the most unfit purgatives; and indeed, from its astringent quality, it is exceptionable at the commencement of the affection, unless it be conjoined with something to render its operation more brisk, such as calomel.

Vomiting has been held a principal remedy in this disease; and may be usefully employed in the beginning, with a view to both the state of the stomach and the fever, but it is not necessary to repeat it often; and unless the emetics employed operate also by stool, they are of little service. Ipecacuanha is by no means a specific; and it proves most useful when so managed as to operate insensibly, or by its diaphoretic properties.

Dr. George Fordyce describes the treatment of dysentery in the following way: he says, evacuation by bleeding is detrimental in *dysentery*, except when it is the natural cure of a phlegmonous inflammation of the intestines, and attended with hardness, fullness, and strength of the pulse. The *primæ viæ* are to be cleared both of the feculent matter and fluids secreted into them; these, as in all cases of increased secretion where the glands are inflamed, being very apt to stimulate and putrefy. When the *stomach* is much affected, an emetic is to be exhibited; and it ought to be managed in the same manner as has been directed in fevers, as we wish it here also to exert its relaxing power, and throw the circulation upon the skin. A purgative is also to be given, and we should choose that which acts principally by increasing the peristaltic motion of the intestines, as it is not a greater secretion which is required, but an evacuation of the matters already contained. Although rhubarb does not purge so copiously, yet, as it clears the *primæ viæ*, it is preferable to most others. While the disease continues, this is to be repeated frequently, for the same purpose, and also to prevent any thing being retained in the upper part of the intestines, where the peristaltic motion is going on too slowly.

After the operation of the purgative, Dr. Fordyce says, we are to endeavour to throw the circulation on the exterior parts of the body by relaxants, thus:

℞ Pulv. Ipecac. gr. i. ad gr. ij. Vel

℞ Sacchar. Alb. gr. v.
Antim. Tartar. gr. $\frac{1}{4}$ ad gr. ss.
Fiat Pulv. quaque hora sumend.

The intestines are, at the same time, to be defended by mucilaginous medicines, and the secretion checked by gentle astringents.

℞ Gum. Arabici ℥ij.
Solve in Aq. Hord. ℔ij. Adde
Syr. Limon. ℥ij.
Bibat pro potu.

℞ Aq. Font. ℔ij.
Corn. Cerv. calc. et præp. ℥ij.
Gum. Arab. ℥ij.

Coque, ut gummi solvatur, et bibat poculum frequenter.

Starch, and other mucilaginous clysters, take off the stimulus arising from attempts to evacuation, when little or nothing is contained in the lower part of the intestines; which stimulus is sometimes the sole cause of the continuance of the disease. When injected every eight or twelve hours, they are now and then sufficient for the cure; and are in all cases useful.

It is also of considerable use to avoid, as much as possible, any attempt to go to stool; and if there be soreness about the anus, it should be rubbed with hog's lard, or any other expressed oil that is just fluid in the heat of the body. Or if the other symptoms are greatly diminished, and this continues, an opiate may be added to the mucilage in the clyster.

Stimulants applied externally to the belly have been found useful in relieving the pain.

℞ Sp. vin. rectif. ℥viij.
Ol. menthæ, ʒij.
Sapon. venet. ℥ss. Solve.
Ventri applicentur lintea calida, linimento hocce madefacta, ter quaterve indies.

Or,

℞ Empl. commun. ℥ij.
Ol. sem. carui ʒij.
Gum. galban. ℥j.
Fiat empl. super alutam extendendum, et abdomini applicandum. Interdum additur Opii ʒj.

At the same time the patient should be kept in as pure air as possible, provided that it be always moderately warm, and that he be not exposed at any time to cold, especially in those circumstances in which it is most liable to affect the system. The food ought to consist of preparations of farinaceous vegetable substances.

If, notwithstanding the treatment already proposed, the purging should go on, so that there is danger to be apprehended from the weakness or irritation, astringents, and particularly opium, may be given along with other medicines, and from $\frac{1}{3}$ to half a grain of it may be taken every eight hours; but when they are employed at the beginning, especially alone, they stop the secretion, but leave the inflammation, and death ensues either from the symptoms of irritation, or now and then from gangrene and mortification of the intestines.

If the disease then continues, and the symptoms of irritation are not very violent, the opium is to be exhibited alone, or spices are to be joined to it; or other astringents may be employed; such as those prescribed in diarrhœa. See Diarrhœa. Or astringents, spices, and opium, may be given together: or ipecacuanha and opium, as in *pulv. ipecac. comp.* or opiates or astringents may be added to the mucilaginous clysters. But it is to be observed, that it is the secretion we wish to stop by these astringents, and not the evacuation of the matters already contained in the intestines; for this reason the purgatives ought to be repeated, even during the use of the astringents.

In recent cases we may expect the cure to succeed quickly; but in those of longer continuance, a perseverance in the proper remedies is necessary, especially if the intestines should be inulcerated; and then indeed the disease is frequently fatal. If a dysentery should arise, with acute pain, the evacuations not being frequent, and the pulse hard, full, and strong, as before described, we are to bleed copiously and repeatedly, and exhibit purgatives that will produce copious evacuations, such as neutral salts; and apply fomentations to the abdomen till the hardness of the pulse and other symptoms of general and phlegmonous inflammation cease: afterwards we are to proceed as before directed.

A dysentery accompanying a fever is also very dangerous, as either disease being cured, the other may continue, and as both together may soon weaken and kill. We are to endeavour to take off the fever, by the remedies already pointed out at the beginning of a violent one, and afterwards to treat the disease as a simple dysentery, being more cautious in employing astringents. After the purging ceases, the patient often becomes costive, and if he be suffered to continue in that state for two or three days, he is apt to relapse; the belly is therefore to be opened by bitter purgatives.

After the disease is cured, the bark may be employed to restore the strength. This is also sometimes of use during the purging; when it has continued long, and the ordinary symptoms of weakness appear.

DYSLO'CHIA, (δυσλοχια; from δυς, *difficultly*, and λοχια, *the lochia*), a suppression of the lochia. See Lochia.

DYSO'DIA, (of the Gr. δυσωδης, from δυς, *bad*, and οζω, *to smell*). Sauvages, and some other nosologists, form a genus of disease which they name thus, and define it to be, stinking exhalations from the whole body, or from a particular part; as stinking breath, stinking feet, &c.

DYSO'PIA, (δυσοπια; from δυς, *bad*, and ωψ, *an eye*), the sight depraved, requiring one certain quantity of light, one particular distance, or one position. It is a genus of disease in the class *locales*, and order *dysæsthesiæ* of Cullen, containing the five following species: 1. *Dysopia tenebrarum*, requiring objects to be placed in a strong light. 2. *Dysopia luminis*, objects only discernible in a weak light. 3. *Dysopia dissitorum*, in which distant objects are not perceived. 4. *Dysopia prox.*

imorum, in which objects too near are not perceived. 5. *Dysopia lateralis;* a defect by which objects cannot be viewed distinctly but in an oblique position. Thus, in viewing an object placed on the left, they turn their face and eye to the right, and *vice versa.* This disorder may proceed from various causes both natural and accidental, some of which admit of no remedy. If it be occasioned by a partial adhesion of the eye-lids, the hand of the surgeon is required; if by a transverse position of the pupil, some mechanical contrivance is necessary. If it be owing to an *albugo*, covering part of the pupil, or to some disease that has rendered a portion of the cornea opaque, the remedies for these affections are to be here applied. Some curious instances of *Dysopia* are to be found in the Edin. Pract. of Med. &c.

DYSORE'XIA, (δυσορεξια,; from δυς, *bad*, and ορεξις, *appetite);* the appetite depraved, or deficient. It is an order in the class *locales* of Cullen's nosology. See NOSOLOGY.

DYSPE'PSIA, (δυσπεψια; from δυς, *bad*, and πεπτω, *to concoct);* an affection of the stomach, with symptoms of debility in the organs of digestion. It is arranged by Cullen in the class *neuroses*, and order *adynamiæ.* It is by no means easy to define exactly the distemper called *dyspepsia*, when considered as an original disease, as there are very few maladies which some way or other do not show themselves by an affection of the stomach; and much more difficult still must it be to enumerate all its symptoms. The most remarkable, however, and the most common, are the following: want of appetite; distension of the stomach when no food has been taken for some time before; slight dejection of spirits; a gradual decay of the muscular strength; languor, and aversion from motion; the food, which is taken without appetite, is not well digested; the stomach and intestines are much distended with flatus, whence the patients are tormented with spasms, gripes, and sickness: frequently a limpid water, having an acid or putrid taste, is brought up; sometimes the food itself is thrown up by mouthfuls; and sometimes, though rarely, the same is swallowed again, after the manner of ruminating animals. While matters are in this situation, the heart sometimes palpitates, and the breath is quick, and drawn with difficulty: the head aches and is giddy; and sometimes both these symptoms are continual, and very violent, insomuch that the patient is not only tormented with pain, but staggers as if he were drunk. From the too great acescency or putrefaction of the aliment, a cardialgia or heartburn comes on; and in this situation, a spontaneous diarrhœa sometimes carries off the disease; but in other cases there is an obstinate costiveness, attended with colic-pains. Frequently the pulse is quick, sometimes slow, but always weak: the circulation is so languid, that the blood can scarce reach the extreme vessels, or at least stagnates in them, so that the face becomes livid, swelled, and has an unusual appearance: and at the same time that the circulation and nervous power are in this languid state, the perspiration becomes less copious; the skin becomes dry and corrugated; the natural heat, especially of the extremities, is much diminished; the tongue is white; and an universal laxity takes place, insomuch that the uvula and velum pendulum palati are sometimes enlarged to such a degree as to become extremely troublesome. The patient is either deprived of rest, or wakes suddenly out of his sleep, and is disturbed by frightful dreams; at the same time that the mind seems to be affected as well as the body, and he becomes peevish, fretful, and incapable of paying attention to any thing as usual. At last hectic symptoms come on, and the whole frame becomes so irritable, that the slightest cause excites an universal tremor, and sometimes violent vomiting and diarrhœa. Sometimes the salivary glands are so relaxed, that a salivation comes on as if excited by mercury; the serum is poured out into the cavity of the abdomen and cellular substance of the whole body, and the patient becomes affected with anasarca or ascites.

The *cause of dyspepsia* may be any thing which debilitates the system in general, but in a particular manner affects the stomach. Such are opium taken in immoderate quantities, which hurts by its sedative and relaxing powers; spirituous liquors drunk to excess; tobacco, tea, coffee, or any warm relaxing liquor, taken in too great quantity; an indolent sedentary life, &c. &c. All these act chiefly upon people of a weak and delicate habit; for the robust and hardy seldom labour under a dyspepsia, or at most a very slight one.

When a dyspepsia first occurs, it is frequently removed without great difficulty: when it is symptomatic, we must endeavour to cure the primary disease; and without this, we cannot expect a complete removal of the affection; but when it frequently returns, with symptoms of great debility, hectic fever, or dropsy, we have great reason to dread the event.

A radical *cure* of dyspepsia is only to be expected by removing from the stomach and system that debility on which the disease depends. On this ground, the objects chiefly to be aimed at in the cure are: 1. The avoiding whatever will tend to diminish the vigour of the stomach; 2. The employing such remedies as have influence in increasing that vigour; 3. And in the third place, the obviating urgent symptoms, particularly those which tend to increase and support the affections. On the avoiding causes which tend to diminish the vigour of the stomach, after what has already been said of the causes inducing the disease, it is unnecessary to make any further observations; and

indeed, every dyspeptic patient will be taught by experience what is to be done with this intention. The medicines chiefly employed with the view of increasing vigour, are those of the tonic kind; but, previous to their use, it will be necessary to evacuate the contents of the alimentary canal by vomits or purgatives. If there be a tendency to putrescency, antiseptics must then be exhibited: but more frequently there is a prevailing acidity, which creates an intolerable heartburn. To palliate this symptom, some magnesia may be given; which is much preferable to the common testaceous powders, as being purgative while dissolved in an acid, when the others are rather astringent. In the third volume of the Medical Observations, we have an account, by Dr. Watson, of two cases of dyspepsia attended with a very uncommon degree of cardialgia, in which magnesia was so successful, that we can scarcely doubt of its efficacy in slighter degrees of the disorder. And in vol. II. of the Transactions of a Society, in London, for the improvement of medical and chirurgical knowledge, Dr. Blane has given an account of the good effects of *kali* in these cases. Cinchona, Colomba, Chamomile, and other bitters, are useful. See those articles.

DYSPERMATI'SMUS, (*δυσπερματισμος*; from *δυς*, *bad*, and *σπερμα*, *seed*); a slow or impeded emission of the semen during coition. It is a genus of disease in the class *locales*, and order *epischeses* of Cullen. This impediment proceeds generally from obstructions in the urethra, or else by tumors in itself, or in the cavernous bodies of the penis; in which case the treatment is the same as in the ischuria urethralis; sometimes it is owing to a kind of epileptic fit, which seizes the man in the venereal act; and sometimes the semen, when ejected from the proper receptacles, is again absorbed by them, or flows into the bladder, and is expelled along with the urine. The last case is very difficult, or indeed impossible to cure; as proceeding from scirrhi, or other indissoluble tumors of the verumontanum, or the neighbouring parts, requiring salivation, and the use of the hemlock internally, and externally in the form of a bath. In some, it proceeds merely from too violent an erection; in which case opiates and emollient and relaxing medicines will be of service: indeed we have an example of a cure performed by means of these, in the first volume of the Edinburgh Medical Essays.

DYSPHA'GIA, (from *δυς*, and *φαγω*, *to eat*); a disease ranked by Dr. Cullen under the class *locales* and order *dyscinesiæ*. He defines it, an impeded deglutition, unattended with inflammatory affection, or injured respiration. This disease was first brought into notice by the late Dr. Munckley, who justly reckons it one of the most deplorable incident to the human body. Its beginning is in general so slight as to be scarce worth notice, the patients perceiving only a small impediment to the swallowing of solid food: they usually continue in this state for many months; during which, all liquid foods, and even solids themselves, when cut small and eaten leisurely, are got down without much difficulty: by degrees the evil increases, and the passage through the œsophagus becomes so narrow, that not the smallest solid whatever can pass through it; but, after having been detained for some time at the part where the obstacle is formed, is returned again with a hollow noise of a very peculiar kind, and with the appearance of convulsion.

The seat of this malady is sometimes near the top of the œsophagus, and at other times further down, nearer the superior orifice of the stomach. In this last case, the part of the alimentary tube which is above the obstruction, is frequently so dilated by the food which is contained in it, as to be capable of containing a large quantity; and the kind of vomiting, by which it is again returned through the mouth, comes on sooner or later after the attempt to swallow, in proportion to the nearness or remoteness of the part affected. In the last stage of this disease, not even liquids themselves can be swallowed, so as to pass into the stomach, and the patient dies literally starved to death.

On the dissection of such as have died in this manner, the œsophagus is found to be considerably thickened; and in some so contracted within, at the diseased part, as scarcely to admit the passing of a common probe: in others, to adhere together in such a manner as entirely to close up the passage, and not to be separated without great difficulty.

Dr. Munckley says, the only medicine, which he ever found of any service, is mercury. In cases which are recent, and where the symptoms have not risen to any great height, small doses of mercury given every night, and prevented, by purgative medicines, from affecting the mouth, he says, have accomplished the cure. But where the complaint has been of long standing, and the symptom has come on of *the food's being returned through the mouth*, a more powerful method of treatment becomes necessary. In this case he never found any thing of the least avail in removing any of the symptoms but mercury, used in such a manner as to raise a gentle, but constant spitting: and this method he pursued, in some cases, with the happiest success.

Some observations on this morbid affection of the throat appear in the Memoirs of the Medical Society of London, from the pen of Mr. Wathen, a surgeon in London He says the *constricted œsophagus* occurs now, more frequently than formerly; and that it is absolutely incurable, except in an early state, and before an ulcer commences; or, in other words, whilst the contraction of the tube is yet simple, with no other thickness or solidity, than what arises from its texture being comprised in a less space than before. The cause, he thinks, may be, the swallowing hot, scalding, or spirituous

liquors, from accident or habit. The seat of the disease, he says, is, nine times out of ten, in that part of the canal where it adheres to the back of the *thyroid cartilage*. In this stage he recommends a daily introduction of a bougie, the size of which should be daily increased; and also the frequently swallowing pills, and at last boluses, of butter and boiled fat, with a view to dilate the tube in that part.

Mr. Home, of London, in his treatise on the application of caustic to strictures in the urethra, also turns his attention to this interesting subject, and suggests the propriety of its application in cases of Dysphagia.

DYSPHO'NIA, (δυσφωνια; from δυς, *bad*, and φωνη, *the voice)*, a difficulty of speaking.

DYSPNŒ'A, (δυσπνοια; from δυς, *difficult*, and πνεω, *to breathe)*; a genus of disease in the class *neuroses*, and order *spasmi* of Dr. Cullen. It is a continual difficult respiration, without sense of stricture, and accompanied with cough through the whole course of the disease. Dr. Cullen describes six species of Dyspnœa: 1. The *catarrhal*, which is readily known by the symptoms of pneumonia and catarrh attending it, and to the removal of which symptoms the care of the physician must be principally directed. 2. The *dry Dyspnœa*. This is generally accompanied with a phthisis pulmonalis; but Sauvages mentions one species of phthisis to which the dry dyspnœa seems more particularly to belong. The patients fall away by degrees, and have a great difficulty of breathing, continual thirst, and little or no spitting. When opened after death, their lungs are found not to be ulcerated, but shrivelled and contracted as if they had been smoke-dried. Goldsmiths and chemists are said to be subject to this disease, by reason of the vapours they draw in with their breath. Sauvages does not mention any particular remedy. Shortness of breath arising from *tubercles*, as they are termed, or a scirrhous enlargement of the lymphatic glands which are dispersed through the lungs, is commonly found in scrofulous habits, and may be distinguished by the concomitancy of those external swellings and appearances which particularly mark the scrofula. This species of dyspnœa generally ends in a phthisis. Courses of goats' whey, and of sea-water, have been known to do service; but it must be confessed, that a perfect cure is seldom obtained. Issues are of use in these cases, as they appear to prevent the ill effects of an over-fulness of blood, if it should happen at any time to supervene. 3. *Dyspnœa* from *changes in the weather*. This seems to be a disease entirely spasmodic, and the fœtid gums and other antispasmodics are accordingly indicated. 4. *Dyspnœa* from *earthy substances formed in the lungs*. Sauvages mentions this disease as much more common in brutes than in the human race; but Dr. Cullen mentions his having seen some instances; and we have several accounts, by different authors, of calculous matters being coughed up by people labouring under a dyspnœa, and threatened with consumption. In three cases of this kind which fell under Dr. Cullen's inspection, there was no appearance of earthy or stony concretions in any other part of the body. The calcareous matter was coughed up frequently with a little blood, sometimes with mucus only, and sometimes with pus. In one of these cases, an exquisite phthisis came on, and proved mortal: in the other two the symptoms of phthisis were never fully formed; and after some time, merely by a milk diet, and avoiding irritation, the patients entirely recovered.

Sauvages also greatly recommends milk in these cases, and soap for dissolving the concretions. The reason why brutes are more subject to these pulmonary calculi than mankind, is that they very seldom cough, and thus the stagnating mucus, or lymph, concretes into a kind of gypseous matter. 5. The *watry dyspnœa*; the *Dyspnœa pituitosa*, or *Orthopnœa ab hydro-pneumonia*, of Sauvages. This may arise from too great a defluxion of mucus on the lungs, or from an effusion of serum, as is mentioned under the pneumonia. The treatment of the disease may be gathered from what has been already said under the heads of Pneumonia, Catarrh, Empyema, &c. 6. The *dyspnœa* from *corpulency; othopnœa a pinguedine*, of Sauvages. There have been many instances of suffocation and death occasioned by too great corpulency. These fatal effects, however, may be almost always avoided if the persons have resolution to persist in an active and very temperate course of life; avoiding animal food, much sleep, and using a great deal of exercise. In the third volume of the Medical Observations, however, there is an extraordinay instance of internal obesity which neither showed itself externally, nor could be removed by any medicines.

Other species of dyspnœa have been considered under Phthisis. It is frequently symptomatic of diseases of the heart and large vessels, or swellings of the abdomen, &c.

DYSU'RIA, (from δυς, *painful*, and ουρον, *urine)*, dysury; a difficulty and pain in voiding the urine. It is a genus of disease in the class *locales*, and order *epischeses*, of Dr. Cullen, who defines it a painful, and, by some means, impeded emission of urine. He distinguishes six species: 1. *Dysuria ardens*, when the urine scalds in passing off, in consequence of inflammation of the mucous membrane of the urethra, or unusual acrimony of the urine itself, there being not any evident disorder in the bladder; as in gonorrhœa. 2. *Dysuria spasmodica*, when a spasm affects the parts which communicate with the bladder. 3. *Dysuria compressionis*, from something contiguous pressing on the bladder. 4. *Dysuria phlo-*

gistica, when the parts about the bladder are inflamed. 5. *Dysuria calculosa*, when there are the signs of a stone in the bladder. 6. *Dysuria mucosa*, when there is a copious secretion of mucus; also called *glus*, *catarrhus vesicæ*, &c.

The dysuria, in some cases, terminates in an entire suppression, or ischuria. See Ischuria. In its simplest form, the remedies directed under the article Strangury, will be advisable. The spasmodic species calls for opium and the warm bath. (See Stricture). Dysury from compression, can only be relieved by taking off the pressure; and that from inflammation of the bladder itself, by the means suggested under Cystitis. The difficulty of urine from a stone in the bladder, is treated of in the article Lithiasis; and that resulting from a morbid accumulation of the natural mucus (a rare occurrence), is most effectually relieved by weak alkaline solutions copiously administered.

Dr. Percival describes, in the Lond. Med. Journal, a species of *chronic dysuria*, to which persons of an arthritic or scorbutic habit, and who have passed the meridian of life, are peculiarly incident. He says it is often mistaken for the stone, and aggravated by the use of lithontriptics. It has, indeed, many symptoms in common with that disorder, such as frequent and urgent calls to make water; pain at each extremity of the urethra; a mucous discharge, tenesmus, and sometimes a suppression of urine: but the patients who labour under it feel no uneasy weight in the perinæum, and always void their water with much less difficulty in an erect than in a horizontal posture. The complaint, also, may be further distinguished from the stone, by having shorter intervals of ease; by more frequently injuring the retentive power of the bladder, and by occasioning no sudden interruption to the stream of urine in the absence of pain. It seems to arise from an acrid defluxion on the coat of the bladder, which is thereby rendered so exquisitely sensible, that the stimulus of the urine becomes almost intolerable, and very frequent efforts are excited to expel it: these efforts, however, should be restrained as much as possible, because they tend to increase the pain and irritation of the bladder, and to prevent the complete discharge of its contents: for that organ cannot sufficiently contract itself without a due degree of previous distension. Of all the remedies which Dr. Percival tried, he says, that mercury was the most successful; it seldom failed to afford relief, and generally produced a cure, if administered with perseverance and in sufficient quantity. According to the urgency of the case, one, two, or three scruples of the ung. hydrargyri should be well rubbed into the thighs every night, till a slight ptyalism ensues. The symptoms for the most part abate before the spitting comes on; and, after it has continued a while, they disappear entirely. Sometimes, in slighter cases, the doctor gave half a grain of calomel, with two grains of *pulv. antimonial.* twice every day: and this small dose of mercury, if duly continued, has effected a cure, without producing any salivation, or even soreness of the mouth.

E

EAR, the organ by which the impressions of sound are received and conveyed to the sensorium. It is situated at the side of the head, and is described by anatomists, as consisting of an external and an internal part. The former named *auricula*, has been described under that head.

The use of the external ear, is like a tunnel to gather the sounds, which by its ridges and hollows are directed to the meatus auditorius, the first part of the internal ear. This is a conduit which goes from the middle of the concha to the tympanum; it is near an inch long, about three or four lines, or twelfth-parts of an inch wide; and its passage is not straight but crooked, passing first upwards, and then downwards, when it has a small tendency upwards again, and the lower part of its extremity bends a little down to the obliquity of the membrana tympani. The beginning of this passage is cartilaginous, being a continuation of the concha contracted; the end of it is bony, which makes the greatest part of the upper and back part of the meatus, as the cartilage does of the lower and fore part. The whole cavity within is lined with a membrane, which seems to be a continuation of the skin which covers the auricula, and which grows thinner and thinner as it approaches the tympanum. On the back side of this membrane there is a great number of little glands, whose excretory ducts bring into the meatus a yellow *cerumen*, whose bitterness and viscidity hinders insects probably from approaching the membrana tympani, which it likewise preserves against the effects of air. The cartilage is always slit, and frequently in more than one place. The meatus has the same vessels which the external ear has, and both have a vein which passes through the eleventh

of the external holes of the skull, and discharges itself into the lateral sinuses.

The inner extremity of the meatus is closed with a thin transparent membrane, of an oval figure, stretched out like the head of a drum, making an obtuse angle with the upper and back part of the meatus, and an acute with the lower and fore part. This is the *membrana tympani*, which is set in a bony circle of the temporal bone, and which wants about half a line of being a complete circle. The handle of a small bone, called the *malleolus*, is tied to this membrane, which it draws somewhat inwards, making it a little concave towards the meatus auditorius: and there runs a small twig of a nerve from the fifth pair upon its inside, called *Chorda Tympani.* The upper edge of this membrane being sometimes not quite closed to the bone, gives a passage for the air from the mouth to the external ear. Behind this membrane there is a pretty large cavity called the *Tympanum*; it is about three or four lines deep, as much wide, and between two and three high: it is lined with a fine membrane, on which there are several veins and arteries. It is always full of a purulent matter in the fœtus.

In this cavity there are four small bones, of which the first is the *malleolus*, or hammer, so called because of its shape. Its head has on its lower side two protuberances, and a cavity whereby it is joined to the incus by ginglymus: its handle, which is pretty long and small, is fastened to the membrana tympani: its whole length is about three lines or a little more. Near its head it has two small processes, and it is moved by three muscles: the first is called *externus;* it rises from the upper and external side of the meatus auditorius, and is inserted into the upper and lower process of the malleolus, which it draws outwards. This is necessary when sounds are too great, because they might break the membrana tympani. The second is the *obliquus;* it lies in the external part of the conduit which goes to the palate, and entering the barrel, it is contained in a sinuosity of the bone by the upper edge of the membrana tympani, and is inserted into the slender process of the hammer, assisting the former muscle in its action. The third is the *internus*, which arises from the extremity of the bony part of the conduit which leads to the fauces, and lies in a sinus of the os petrosum, till it passes over a little rising of the bone at the *fenestra ovalis*, to be inserted into the posterior part of the handle of the malleolus. This muscle, by pulling the hammer inwards, distends the membrana tympani.

The second small bone is called the *Incus*, or anvil: it has a head and two legs; its head, which is near two lines long, above one broad, and but half a line thick, has a protuberance, and two cavities, whereby it is articulated with the hammer; the shorter of its legs is tied to that side of the conduit which goes to the processus mammillaris, and its longer leg to the head of the third bone, called the *stapes* or *stirrup*, because of its resemblance: it is of a triangular figure, made of two branches set upon a flat basis, which stands upon the foramen ovale. The space between the two branches is filled up by a fine transparent membrane. The union of the two branches is called the head of the stirrup, in which there is a small cavity, wherein lies the fourth bone. The height of the stapes is a line and a half, the length of it above a line, and the breadth half a line. There is a small muscle which arises out of a small canal in the bottom of the tympanum, and which is inserted into the head of the stirrup, the os orbiculare, which is a very small bone, being convex on that side which is received into the cavity of the head of the stirrup, and hollow on the other side, where it receives the long leg of the anvil, which is only joined to the stirrup by means of this fourth bone.

Besides these bones, there are several holes in the tympanum: the first is in its fore part near the membrana tympani: it is the entry to the sinus in the mammillary process. The second is the orifice of a conduit which leads to the palate of the mouth; the beginning of this passage is very narrow and bony, the middle is cartilaginous; and its extremity, which opens near the uvula, is above four lines wide, membranous, and dilated by some muscular fibres: and they open the extremity of this passage either when we open our mouths to hear more distinctly; or, when it is necessary there should be a free communication between the external air, and that in the cavity of the tympanum. The third and fourth are in the internal process of the os petrosum; the one is called *fenestra ovalis;* the basis of the stirrup stands upon it, and it is in the entry to the vestibulum: the other, called *fenestra rotunda*, is covered by a fine membrane, inclosed in a chink of this hole; and it leads to the cochlea.

The *vestibulum* is a cavity in the os petrosum, behind the fenestra ovalis: it is above two lines broad, as much long, and a line and a half high. In it open the semi-circular pipes of the labyrinth, the upper part of the cochlea, and the auditory nerve, at five small holes.

The *labyrinth* is made of three semicircular pipes, above half a line wide, excavated in the os petrosum; they open by five orifices into the vestibulum. That which is called the superior canal, and is generally about five or six lines long, joins one of its extremities to that which is called the superior canal, and these two extremities open by one orifice; but the middle tube opens at each end by itself, into the vestibulum.

The last cavity of the ear is the *cochlea.* It resembles a snail's shell. Its canal, which winds in a spiral line, is divided into two, the upper and lower, by a thin spiral lamina, of which the part

next the axis is bony, but extremely brittle; and that next the outer shell is membranous, appearing only to be made of the auditory nerve. The upper canal opens into the tympanum: this is narrower than that, especially towards the basis of the cochlea, where each is about a line wide, and the basis itself is about four lines diameter.

The vessels of the internal ear are arteries and veins, from the internal carotid and jugulars. The *nervus auditorius* enters by the hole in the internal process of the os petrosum. It consists of two bundles, of which one is hard, the other soft. Five branches of the portio mollis enter the vestibulum, and form a delicate web, which sends slips that run through the semicircular canals; and the rest of the portio mollis enters the cochlea at the center of its base, and turns with the spiral line, of which it probably makes the membranous part. The portio dura passes through its proper passages, to be distributed among the external parts about the ear.

The several parts which compose the ear are more particularly described under their proper heads. For an account of the functions of this organ see HEARING; and for its diseases, see DEAFNESS.

EARTHS, in chemistry, are defined by Cronstedt to be such substances as are not ductile, mostly indissoluble in water or oil, and that preserve their constitution in a strong heat. Mr. Bergmau remarks that they are insipid, and not soluble in 1000 times their weight of boiling water; though, by augmenting the heat, as in Papin's digester, perhaps all the kinds we are yet acquainted with may be found capable of solution, especially when precipitated from some other menstruum; their surface being then greatly augmented. In this chain of nature, they proceed by an insensible gradation towards the salts; so that they cannot be separated but by artificial limits. A moderate heat does not change their form, nor are they dissipated by a more violent one. Dr. Black defines them to be such bodies as are not soluble in water, not inflammable, and their specific gravity not more than four times the weight of water. They are distinguished from the salts by their insolubility; from the inflammables, by their want of inflammability; and from the metals, by their deficiency in weight. Some objections have been made to this definition, as not being strictly applicable to those earths which are known to be soluble in water: but this objection may be accounted of little weight, when we consider the extreme disparity betwixt the solubility of the earths and salts, a few grains of the earths saturating some pounds of water; so that if they have any solubility, they must be allowed to possess but a very small share of it.

Another property, which is not usually taken into the definition, makes nevertheless a remarkable character of the earthy bodies, viz. their great fixedness in the fire. All the other classes of bodies show themselves volatile in more or less violent degrees of heat. All the salts can be made to evaporate; all the inflammable substances are volatile; all the metals, gold not excepted, have been converted into vapour; but the earths, as far as we know, have never been volatilized, excepting only two, the diamond and asbestos. Some phenomena attending the volatilization of the diamond give reason to suspect that it is not a pure earthy substance. There is an appearance of inflammation; and it seems to be a compound, having an earthy matter for its basis, and deriving its volatility from other matters. In general, therefore, the earths have been found fixed in any degree of heat of which we have had experience; though there is no doubt a possibility, that heat might be raised to such an intensity as to volatilize the most fixed body in nature; but till the means of doing so shall be found out, the earths may be considered as absolutely fixed.

The earths called *primitive* or *simple*, because they cannot be decomposed by any method hitherto known, were by Cronstedt supposed to be nine; but later chemists have reduced them to five. Some reduce the number still further; but Mr. Bergman informs us, that these "rest their opinions upon fanciful metamorphoses, unsupported by faithful experiments." As experiments teach us that there are five primitive earths, it is evident that the species arising from their mixture cannot exceed 24, viz. ten double, consisting of two earths; six triple, three quadruple, and the five primitive earths. Even all these different mixtures have not been found, though they probably do exist in nature. The natural compositions of acids with the earths, forming substances not soluble in 1000 times their weight of boiling water, and which may be called *saline earths*, are undoubtedly chemical combinations. The five primitive earths are, barytes; calcareous earth, capable of being reduced into quicklime; magnesia; alumine; and silex. "But though we consider these as the most pure of all the earthy bodies, they are never found native in a state of absolute purity; nor indeed can they be made perfectly pure even by artificial means. Water and carbonic acid unite readily with the four first; and when expelled by fire, a little of the matter of heat is added, until driven out by a more powerful attraction. But in this state they possess a degree of purity not to be attained by any other known method. Therefore it is necessary to examine them when sufficiently burnt, in order to distinguish better what properties depend upon adhering heterogeneous matters."

Bergman at first added the earth of gems to the five classes already mentioned; but he found afterwards, that these are compounded of some of the

five earths already mentioned, particularly of the argillaceous; insomuch that they may be said almost entirely to belong to that class.

The earths chiefly used in medicine are, the argillaceous (boles), the calcareous, magnesia, alumine, and barytes: see those articles.

EARTH, ABSORBENT. See Absorbents.

EARTH, ALUMINOUS; that which contains alum. These are found in several parts of England, Scotland, and many other places. See Alumen.

EARTH-BATH; a remedy, recommended by some writers, as a specific in consumption. Van Swieten, in his Commentaries on Boerhaave, tells us, from the information of a person of credit, that in some parts of Spain they have a method of curing the phthisis pulmonalis by the use of this remedy; and he quotes the celebrated Solano de Luque in confirmation of this practice. Solano speaks of the *banos de tierra*, as a very old and common remedy in Granada and some parts of Andalusia, in cases of hectic fever and consumption; and relates several instances of their good effects in his own practice. The method he adopted on these occasions was as follows: he chose a spot of ground on which no plants had been sown, and there he made a hole large and deep enough to admit the patient up to the chin. The interstices of the pit were then carefully filled up with the fresh mould, so that the earth might every where come in contact with the patient's body. In this situation the patient was suffered to remain till he began to shiver or felt himself uneasy; and during the whole process, Solano occasionally administered food, or some cordial medicine. The patient was then taken out, and, after being wrapped in a linen cloth, was placed upon a mattress, and two hours afterwards his whole body was rubbed with an ointment, composed of the leaves of the *solanum nigrum* and hog's lard. He observes, that a new pit must be made every time the operation is repeated; and advises the use of these baths only from the end of May to the end of October.

Dr. Fouquet, an ingenious French physician, tried this remedy in two cases. In one, a confirmed phthisis, he was unsuccessful; but the remedy had not a fair trial. The patient, a man thirty years of age, had been for several months afflicted with cough, hectic fever, and profuse colliquative sweats. He was first put into the earth in the month of June; but soon complained of an uneasy oppression at his stomach, and was removed at the end of seven minutes. The second time he was able to remain in it half an hour, and when taken out was treated in the way prescribed by Solano. In this manner the baths were repeated five times, and the patient was evidently relieved; but having conceived a dislike to the process, he refused to submit to any further trials, and died some months afterwards. In the second case he was more fortunate: the patient, a girl eleven years of age, had been for three months troubled with a cough, brought on by the measles, which was at length attended with a purulent expectoration, hectic fever, and night-sweats. She began the use of the earth-bath in August, and repeated it eight times in the space of twenty days. At the end of that time the fever and disposition to sweat had entirely ceased, and by the use of the common remedies, the patient was perfectly restored. A physician at Warsaw likewise prescribed the earth-bath with good success in cases of hectic fever. The Spaniards confine it entirely to such cases; but, in some other parts of the world, we find a similar method employed as a remedy for other diseases, and particularly for the sea-scurvy. Dr. Priestley observes, that the Indians, he has been told, have a custom of burying their patients, labouring under putrid diseases, up to the chin in fresh mould, which is also known to take off the fœtor from flesh-meat beginning to putrefy. The efficacy of this remedy in the sea-scurvy has, it is said, frequently been experienced by the crews of our East-India ships.

The earth-bath, both in consumptive cases, and likewise in a variety of other affections, was some years ago extensively tried, in Britain, by Dr. Graham, a celebrated empiric. But, as far as we can learn, in most cases, it produced to the patient a very distressing sensation of cold; in some, it seemed to be productive of bad effects, probably in consequence of that cold; and we have not heard of any consumptive cases in which good effects were decidedly obtained from it.

EARTH, ARGILLACEOUS. See Earth.

EARTH, BOLAR. See Bole.

EARTH, FULLER'S, the *Cimolia purpurescens*; a compact bolar earth, most commonly of a greyish or light brown colour. It is sometimes applied, by the common people, to inflamed breasts, excoriated parts, &c. with a view of cooling them.

EARTH, HEAVY; *terra ponderosa*. See Barytes.

EARTH, JAPAN. See Catechu.

EARTH-NUT. See Pig-nut.

EARTH, SEALED, *terra sigillata;* little cakes of bolar earth, stamped with impressions. These were formerly in high estimation as absorbents, but are now fallen into disuse.

EARTH-WORM; the *lumbricus terrestris*, or *vermis terrestris*. See Lumbricus. These creatures are supposed to possess a diuretic and antispasmodic virtue, and with these views they are still occasionally employed as a medicine in foreign countries.

EAR-WAX, *cerumen aurium;* a waxy secretion found in the meatus auditorius externus, into which it is discharged by the glands around that canal. See Ear, and Cerumen.

EASTERN ANACARDIUM. See Anacardium.

EASTERN BUCK-WHEAT. See Buck-wheat, Eastern.

EASTERN FOX-GLOVE. See Fox-glove, Eastern.

EATON'S STYPTIC; an empirical remedy, consisting of brandy highly impregnated with calcined vitriolated iron.

EAU-DE-LUCE. See Spiritus ammoniæ succinatus.

EAU-DE-RABEL, a medicinal composition, consisting of one part of sulphuric acid, added to three of rectified spirit of wine. This is much used in France in the cure of gonorrhœa, leucorrhœa, &c.

EBULLITION, (*ebullitio*, from *ebullio*, to bubble up): boiling. This consists in the change which a fluid undergoes, from a state of liquidity to that of an aeriform fluid or gas, in consequence of the application of heat, which dilates and converts it into vapour.

E'BULUS, (from *ebullio*, to make boil; so called, because of its use in purifying the humours of the body); dwarf elder, or dane-wort. The root, interior bark, leaves, flowers, berries, and seeds of this herbaceous plant, *Sambucus ebulus; cyniestrifidis, stipulis foliaceis, caule herbaceo*, of Linnæus, have all been administered medicinally, in moderate doses, as resolvents and deobstruents, and, in larger doses, as hydragogues. The plant is chiefly employed by the poor of this and other countries, amongst whom it is in common use as a purgative; but Dr. Cullen speaks of it as a violent remedy.

ECCHYMO'MA, (εκχυμωμα, *an extravasation of blood)*, an *ecchymosis*, or extravasation. It is a black and blue swelling, caused either by a bruise or extravasation of blood. A genus of disease in the class *locales*, and order *tumores* of Cullen, is thus named. See Bruise.

ECCHYMO'SIS, (εκχυμωσις, from εκχυω, *to pour out*, and αιμα, *blood)*; a disorder of the superficial parts of the body, which happens when, by a contusion, the capillary vessels are broken, and their contained fluids extravasated: these, stagnating, change the natural colour of the part to brown, livid, or black. In the operation of blood-letting, a small tumor is raised immediately above the orifice in the vein, by the blood insinuating itself into the cellular substance of the neighbouring p rts: such a tumor, when round and small, is termed a Thrombus, and when more diffused, an Ecchymosis.

ECCOPRO'TICS, (*eccoprotic,a* εκκοπρωτικα; from εκ, and κοπρος, *dung)*; aperient medicines, whose operation is very gentle; such as *manna*, *senna*, *castor oil*, &c.

ECDO'RA, (εκδορα, from εκδερω, *to excoriate)*, excoriation; and particularly used for an excoriation of the urethra.

ECHINATE, (from *echinus*, a hedge-hog), in botany, an epithet applied to such seeds as are prickly and rough.

ECHINITES, (from *echinus*, an urchin, or hedge-hog). Certain petrefactions are thus called, from their likeness to the sea hedge-hog, or urchin.

ECHINUS MARINUS, the sea hedge-hog, or urchin. The spine of the larger urchins was called Lapis Judaicus.

ECLA'MPSIS, (from εκλαμπτω, *to shine)*, a flashing or sparkling light, which strikes the eyes of epileptic patients. Cœlius Aurelianus calls them *scintillations* or *fiery circles*. This, though only a symptom of the epilepsy, Hippocrates employs to denote the *epilepsy* itself; but Dr. Cullen places it as a synonyme with epilepsia, and says, "Vogel and Sauvages will distinguish *eclampsia*, as an acute disease, from epilepsy, which they consider a chronic one; but as it is very difficult, every where, to place accurate limits between acute and chronic diseases; and as the eclampsia of Sauvages will exactly agree, for the most part, as well in the causes as symptoms, with epilepsy, I could by no means arrange it different in genus from epilepsy."

ECLE'CTICA MEDICI'NA, (εκλεκτικη, from εκλεγω, *to elect)*. Archigenus, and some others, selected from all other sects what appeared to them to be the best and most rational; hence they were called *Eclectics*, and their medicine *Eclectic Medicine*.

ECLE'GMA, (εκλειγμα, from εκλειχω, *lingo*, to lick); a form of medicine made by the incorporation of oils with syrups, and which is to be taken upon a piece of liquorice root. It is synonimous with Lambative, (from *lambo*, which signifies the same); and *Linctus*.

ECPHRACTICS (from εκφραττω); such medicines as are supposed to attenuate viscid humours, so as to promote their discharge.

EC'STASIS, (εκστασις, from εξιστημια, *to be out of one's senses)*; an extacy or trance. In Hippocrates it signifies a delirium. Dr. Cullen ranks it as a kind of apoplexy. See Exstasis.

ECTO'PIÆ, (εκτοπιω, from εκτοπος, *out of place)*; parts of the body displaced. This constitutes an order in the class *locales* of Cullen's Nosology. See Nosology.

ECTRO'PIUM, (εκτροπιον, from εκτρεπω, *to pervert*, or *invert)*; a disease of the eyes, in which the eye-lids are so everted, or turned outward, that their interior red skin becomes prominent, and the eyes cannot be sufficiently covered by them. When this happens to the upper eye-lid; in consequence of the resemblance it then bears to a hare's eye, it is called by the Greeks, *lagophthalmus*, or *lagophthalmia*, hare's-eye. Thus Paulus Ægineta describes the *ectropium* as peculiar to the under eye-lid, and *lagophthalmus* to the upper. Sometimes this disorder is caused by cicatrices after wounds, exulcera-

tions, burns, or more frequently from the protuberance of the internal fleshy parts. In old people, a relaxation of the orbicular muscle sometimes causes it in the lower eye-lid. When a contraction of the eye-lid is the cause, an incision in the form of a crescent may be made at a small distance from the eye-lashes. In the upper eye-lid the points of the incision should be downwards, and in the under eye-lid upwards; by which the skin will be separated. The number of incisions may be one or more, according to the degree of the contraction; if more than one is required, we should make the rest parallel to the first, and at a small distance from it. The necessary incisions being made, it is necessary to stretch the skin, and lay compresses of lint between; and it is proper also, at the second dressing, to spread the lint with some digestive ointment to encourage the fleshy granulations rising between the incisions. Slips of sticking-plaster must be used to keep the upper and lower eye-lids closed, until the incisions are firmly healed.

Tumors in the orbit are sometimes the cause, and when these are not of a cancerous kind, the cure will depend on their extirpation.

EDULCORATION, signifies the washing out offensive substances, combined with others of a different nature. The process may be exemplified in the separation of certain salts from the substances that contain them; by exposing the particles of the latter to the action of water, which dissolves and carries off the salt, leaving what remains *edulcorated.* This term also means the sweetening of any thing with sugar or syrup.

EFFERVESCENCE, (from *effervesco*, to grow hot), in chemistry, an intestine motion excited between the parts of two bodies of different natures, when they reciprocally dissolve or act on each other. It is attended with bubbling, vapour, small jets of the liquid, and a hissing noise; and these phenomena are occasioned by the air which at that time disengages itself. Sometimes also it is accompanied with a great degree of heat. This term we sometimes find confounded with *fermentation*, which is altogether a different thing.

EFFLORESCENCE, (from *effloresco*, to blow as a flower); the same with exanthema. See Exanthema. In chemistry, it denotes the formation of a kind of mealy powder on the surface of certain bodies. Efflorescence is occasioned either by decomposition or drying. The efflorescence which happens to cobalt and martial pyrites is of the first; and that observed on the crystals of fossil alkali, Glauber's salt, &c. of the latter kind. An efflorescence is sometimes also a species of crystallization, the nature of which is not well understood; as, the beautiful vegetations which shoot up from vitriolated kali, acidulated either with the vitriolic or nitrous acids, the saline spiculæ which are observed to shoot from salt butter, &c.

EFFLORESCE'NTIA, (from *effloresco*, to bloom), in botany, the precise time of the year and month in which every plant shows its first flowers. Some plants flower twice a-year, as is common between the tropics; others oftener, as the monthly rose. The former are called by botanists *biferæ;* the latter *multiferæ.* The time of flowering is determined by the degree of heat which each species requires. Mezereon and snow-drop produce their flowers in February; primrose, in the beginning of March; the greater number of plants, during the month of May; corn, and other grain, in the beginning of June; the vine, in the middle of the same month; several compound flowers, in the months of July and August; lastly, meadow-saffron flowers in the month of October, and announces the speedy approach of winter. Grass of Parnassus always flowers about the time of cutting down the hay; and in Sweden, the different species of thistle, mountain-lettuce, succory, and balsam, seldom flower till after the summer solstice: the countrymen even know, as by a kalendar, that the solstice is past, when these plants begin to produce their flowers. All plants are earlier in warm countries: hence such as are cultivated out of their native soil, never flower till the heat of the climate, or situation into which they are removed, is equal to that under the influence of which they produced flowers in their own country. For this reason, all exotics from warm climates are later in this country than many plants which it naturally produces. In general, we may observe, that the plants of the coldest countries, and those produced on the mountains in all climates, being of equal temperature, flower about the same time, viz. during our spring in Europe. Plants that grow betwixt the tropics, and those of temperate climates, flower during our summer. Plants of temperate climates, situated under the same parallel of latitude with certain parts of Europe, but removed much farther to the West, such as Canada, Virginia, and Mississippi, do not produce flowers till autumn. Plants of temperate climates in the opposite hemisphere to Europe, flower during our winter, which is the summer of these regions. Linnæus and Adanson have given a sketch of the different times in which plants flower at Upsal and Paris.

EFFLU'VIUM, (from *effluo*, to spread abroad), in physiology, a term much used by philosophers and physicians, to express the minute particles which exhale from most, if not all, terrestrial bodies, in the form of insensible vapour. See Contagion.

EFFUSION, (from *effundo*, to pour out); the pouring out of any liquid thing with some degree of force. In pathology, it denotes the morbid accumulation of any fluid, as of serum, &c. in the cellular membrane, or in the cavities of the body. In the ancient heathen sacrifices, there were va-

rious effusions of wine and other liquors, called *libations*.

EGG, in physiology, a body formed in certain females; in which is contained an embryo or fœtus of the same species, under a cortical surface or shell. The exterior part of an egg is the shell; which in a hen, for instance, is a white, thin, and friable cortex, including all the other parts. The shell becomes more brittle by being exposed to a dry heat. It is lined every where with a very thin but a pretty tough membrane, which dividing at, or very near, the obtuse end of the egg, forms a small bag, where only air is contained. In new-laid eggs this follicle appears very little, but becomes larger when the egg is kept.

Within this are contained the albumen or white, and the vitellus or yolk; each of which have their different virtues. The albumen is a cold, viscous, white liquor in the egg, different in consistence in its different parts. It is observed, that there are two distinct albumens, each of which are inclosed in its proper membrane. Of these one is very thin and liquid: the other is more dense and viscous, and of a somewhat whiter colour; but, in old and stale eggs, after some days incubation, inclining to a yellow. As this second albumen covers the yolk on all sides, so it is itself surrounded by the other external liquid. The albumen of a fecundated egg is as sweet and free from putrefraction, during all the time of incubation, as it is in new-laid eggs; as is also the vitellus. As the eggs of hens consist of two liquors separated one from another, and distinguished by two branches of umbilical veins, one of which goes to the vitellus, and the other to the albumen; so it is very probable that they are of different natures, and consequently appointed for different purposes. When the vitellus grows warm with incubation, it becomes more humid, and like melting wax or fat; whence it takes up more space. For, as the fœtus increases, the albumen insensibly wastes away and condenses: the vitellus, on the contrary, seems to lose little or nothing of its bulk when the fœtus is perfected, and only appears more liquid and yielding when the abdomen of the fœtus begins to be formed.

The chick in the egg is first nourished by the albumen; and when this is consumed, by the vitellus, as with milk. If we compare the *chalazæ* to the extremities of an axis passing through the vitellus, which is of a spherical form, this sphere will be composed of two unequal portions, its axis not passing through its centre; consequently, since it is heavier than the white, its smaller portion must always be uppermost in all positions of the egg. The yellowish white round spot, called *cicatricula*, is placed on the middle of the smaller portion of the yolk; and therefore, from what has just been said, must always appear on the superior part of the vitellus. Not long before the exclusion of the chick, the whole yolk is taken into its abdomen; and the shell, at the obtuse end of the egg, frequently appears cracked some time before the exclusion of the chick. The chick is sometimes observed to perforate the shell with its beak. After exclusion, the yolk is gradually wasted, being conveyed into the intestines by a small duct.

Eggs differ very much, according to the birds that lay them, as to their colour, form, bigness, age, &c. Those most used in food are hens' eggs; of which, such as are new-laid are best. As to the preservation of eggs, it is observed that the egg is always quite full when it is first laid by the hen; but from that time it gradually becomes less and less so, to its decay: and however compact and close its shell may appear, it is nevertheless perforated with a multitude of small holes, though too minute for the discernment of our eyes, the effect of which is a daily decrease of matter within the egg, from the time of its being laid; and the perspiration or evaporation is much quicker in hot weather than in cold. To preserve the egg fresh, therefore, there needs no more than to preserve it full, and stop its transpiration; the method of doing which is, by stopping up those pores with matter which is not soluble in watery fluids; as by spirit-varnish, tallow, or mutton fat, rubbed over the shell.

When employed as food, it is usually after eggs have been coagulated by heat, but even when taken raw, they undergo a coagulation in the stomach before they are digested so as to afford the proper animal fluid. Dr. Cullen considers it a very singular fact, and one difficult of explanation, that the white of egg, even in very small quantity, whether in its liquid or coagulated state, proves constantly the occasion of much sickness in the stomachs of some persons; while, in the most part of other men, it proves an agreeable and readily digested food. It is indeed surprising, he says, what a quantity of eggs will be digested by some persons; though he is persuaded, that *in most persons this power is very limited*, and that a smaller bulk of this than of any other food, will satisfy and occupy the digestive powers of most men. At the same time, he allows, that egg seems to be a less alkalescent food than almost any other animal substance, and during its digestion to be less stimulant. Whether eggs have more or less disposition to render the body plethoric, than the other species of animal food, Dr. Cullen does not determine; but he says their being eaten in a state any way approaching to putrefaction is pernicious. Nothing very particular in the qualities of the eggs of different birds has been discovered, or whether they are, in any case, considerably different, is uncertain; but Dr Cullen is disposed to think they they are very little so: indeed he is certain, that, in many instances, the peculiar

odour and taste of the flesh of the bird is in no degree communicated to the eggs.

EJECTION, signifying to throw out, is the discharge of any thing by vomit, by stool, or any other emunctory.

ELABORATION, strictly signifies the working any thing with the hands; but this term is generally applied to the digestion, or concoction, of the animal fluids.

ELAPHOBOSCUM, (ελαφοβοσκον; from ελαφος, *a stag*, and βοσκω, *to eat*; so called, because deer eat them greedily); the wild parsnip. See PASTINACA.

ELASTIC FLUID. See GAS.

ELASTIC GUM. See CAOUTCHOUC.

ELASTICITY; that disposition in bodies, by which they endeavour to restore themselves to the posture from whence they were displaced by any external force.

The principal phenomena observable in Elastic bodies, are 1. That an elastic body (*i.e.* a body perfectly elastic, if any such there be) endeavours to restore itself with the same force with which it is pressed or bent.—2. An elastic body exerts its force equally towards all sides; though the effect is chiefly found on that side where the resistance is weakest; as is evident in the case of a gun exploding a ball, a bow shooting out an arrow, &c.—3. Elastic bodies, in what manner soever struck, or impelled, are inflected and rebound after the same manner: thus a bell yields the same musical sound, in what manner, or on what side soever it be struck; the same of a tense or musical chord; and a body rebounds from a plane in the same angle in which it meets or strikes it, making the angle of incidence equal to the angle of reflection, whether the intensity of the stroke be greater or less.—4. A body perfectly fluid, if any such there be, cannot be elastic, if it be allowed that its parts cannot be compressed.—5. A body perfectly solid, if any such there be, cannot be elastic; because, having no pores, it is incapable of being compressed.—6. The elastic properties of bodies seem to differ, according to their greater or less density or compactness, though not in an equal degree: thus, metals are rendered more compact and elastic by being hammered: tempered steel is much more elastic than soft steel; and the density of the former is to that of the latter as 7809 to 7738: cold condenses solid bodies, and renders them more elastic; whilst heat, that relaxes them, has the opposite effect: but, on the contrary, air, and other elastic fluids, are expanded by heat, and rendered more elastic.

Elastic vapours, or *fluids*, are such as may be compressed mechanically into a less space, and which resume their former state when the compressing force is withdrawn. Such as atmospherical air, and all the aerial fluids, with all kinds of fumes raised by means of heat, whether from solid or fluid bodies.

Of these, some remain elastic only while a considerable degree of heat is applied to them, or to the substance which produces them; while others continue elastic in every degree of cold that has yet been observed. Of the former kind, are the vapours of water, spirit of wine, mercury, sal-ammoniac, and all kinds of sublimable salts: of the latter, those of muriatic acid, mixtures of vitrolic acid and iron, nitrous acid, and various other metals, and in short the several species of aerial fluids indiscriminately. The elastic force with which any one of these fluids is endowed, has not yet been calculated, as being ultimately greater than any obstacle we can put in its way.

The *elasticity of fluids* is accounted for from their particles being all endowed with a centrifugal force; whence Sir Isaac Newton demonstrates, (prop. 23, lib. 2), that particles, which naturally avoid or fly off from one another by such forces as are reciprocally proportional to the distances of their centres, will compose an elastic fluid, whose density shall be proportional to its compression; and vice versa, if any fluid be composed of particles that fly off or avoid one another, and have its density proportional to its compression, then the centrifugal forces of those particles will be reciprocally proportional to the distances of their centres.

The *elasticity of the air* is not only proportional to its density, but is always equal to the force which compresses it, because these two exactly balance each other. This elasticity, in the atmospheric air, is measured by the height of the barometer at any time, allowing for its heat or temperature, after this rate, viz. the 434th part for each degree of Fahrenheit's thermometer, above or below some mean temperature, as 55°; for by that part of the whole it is that air expands or contracts, or else increases or decreases in its elasticity, for each degree of the thermometer.

ELATERIUM, (ελατηριον; from ελαυνω, *to stimulate* or *agitate*: so named from its violently purgative qualities); the juice of the *Cucumis agrestis*. See CUCUMIS AGRESTIS.

ELATINE, (ελατινη; from ελαττων, *smaller*, being the smaller species), FLUELLEN, or female speedwell; the *Antirrhinum elatine*, Linn. The leaves of this plant have a rough and bitter taste, but no smell. It was formerly much used as a remedy against scurvy and old ulcerations, but it is now deservedly forgotten.

ELBOW, that part of the arm which projects, when the hand is raised up to the shoulder. See CUBIT.

ELCOSIS, (ελκωσις; from ελκος, *an ulcer*); a disease attended with fœtid, carious, and chronic ulcers. The term is seldom used at present.

ELDER. See SAMBUCUS.

ELDER, DWARF. See EBULUS.

ELECAMPANE. See ENULA CAMPANA.

ELECTIVE ATTRACTION, in chemistry, that species of affinity by which different bodies are spontaneously induced to combine and form new products. The doctrine of these has been fully set forth under the articles ATTRACTION and AFFINITY. The subject, however, remains to be illustrated by the following *Tables of simple elective Attraction*, as corrected by Dr. Andrew Duncan. These require no other explanation, than that the substances enumerated are considered to be simple, as far as relates to the facts at present known; and that the attraction which each has for that at the head of the column, is greater or less according to its distance below the latter.

Oxygen.
Carbon,
Charcoal,
Manganese,
Zinc,
Iron,
Tin,
Antimony,
Hydrogen,
Phosphorus,
Sulphur,
Arsenic,
Nitrogen,
Nickel,
Cobalt,
Copper,
Bismuth,
Caloric?
Mercury,
Silver,
Arsenious acid,
Nitric oxid,
Gold,
Platina,
Carbonic oxid,
Muriatic acid,
White oxid of Manganese,
White oxid of Lead.

Oxygen (a).
Titanium,
Manganese,
Zinc,
Iron,
Tin,
Uranium,
Molybdenum,
Tungsten,
Cobalt,
Antimony,
Nickel,
Arsenic,
Chrome,
Bismuth,
Lead,
Copper,
Tellurium,
Platina,
Mercury,
Silver,
Gold.

Carbon.
Oxygen,
Iron,
Hydrogen.

Nitrogen.
Oxygen,
Sulphur?
Phosphorus,
Hydrogen.

Hydrogen.
Oxygen,
Sulphur,
Carbon,
Phosphorus,
Nitrogen.

Sulphur.
Phosphorus.
Potass,
Soda,
Iron,
Copper,
Tin,
Lead,
Silver,
Bismuth,
Antimony,
Mercury,
Arsenic,
Molybdenum.

Potass, Soda, and Ammonia.
Acids. Sulphuric,
—— Nitric,
—— Muriatic,
—— Phosphoric
—— Fluoric,
—— Oxalic,
—— Tartaric,
—— Arsenic,
—— Succinic,
—— Citric,
—— Lactic,
—— Benzoic,
—— Sulphurous
—— Acetic,
—— Mucic,
—— Boracic,
—— Nitrous,
—— Carbonic,
—— Prussic,
Oil,
Water,
Sulphur.

Barytes.
Acids. Sulphuric,
—— Oxalic,
—— Succinic,
—— Fluoric,
—— Phosphoric
—— Mucic,
—— Nitric,
—— Muriatic,
—— Suberic,
—— Citric,
Acids. Tartaric,
—— Arsenic,
—— Lactic,
—— Benzoic,
—— Acetic,
—— Boracic,
—— Sulphurous
—— Nitrous,
—— Carbonic,
—— Prussic,
Sulphur,
Phosphorus,
Water,
Fixed oil.

Strontia.
Acids. Sulphuric,
—— Phosphoric
—— Oxalic,
—— Tartaric,
—— Fluoric,
—— Nitric,
—— Muriatic,
—— Succinic,
—— Acetic,
—— Arsenic,
—— Boracic,
—— Carbonic,
Water.

Lime.
Acids. Oxalic,
—— Sulphuric,
—— Tartaric,
—— Succinic,
—— Phosphoric
—— Mucic,
—— Nitric,
—— Muriatic,
—— Suberic,
—— Fluoric,
—— Arsenic,
—— Lactic,
—— Citric,
—— Malic,
—— Benzoic,
—— Acetic,
—— Boracic,
—— Sulphurous
—— Nitrous,
—— Carbonic,
—— Prussic,
Sulphur,
Phosphorus,
Water,
Fixed oil.

Magnesia.
Acids. Oxalic,
—— Phosphoric
—— Sulphuric,
—— Fluoric,
—— Arsenic,
—— Mucic,
—— Succinic,
—— Nitric,
—— Muriatic,
—— Tartaric,
—— Citric,
—— Malic?
—— Lactic,
—— Benzoic,
—— Acetic,
—— Boracic,
—— Sulphurous
—— Nitrous,
—— Carbonic,
—— Prussic,
Sulphur.

Alumine.
Acids. Sulphuric,
—— Nitric,
—— Muriatic,
—— Oxalic,
—— Arsenic,
—— Fluoric,
—— Tartaric,
—— Succinic,
—— Mucic,
—— Citric,
—— Phosphoric
—— Lactic,
—— Benzoic,
—— Acetic,
—— Boracic,
—— Sulphurous
—— Nitrous,
—— Carbonic,
—— Prussic,

Silica.
Fluoric acid,
Potass.

Oxid of Platina.
—— *Gold (b).*
Gallic acid,
Muriatic,
Nitric,
Sulphuric,
Arsenic,
Fluoric,
Tartaric,
Phosphoric,
Oxalic,
Citric,
Acetic,
Succinic,
Prussic,
Carbonic,
Ammonia.

Oxid of Silver.
Gallic acid,
Muriatic,
Oxalic,
Sulphuric,
Mucic,
Phosphoric,
Sulphurous,
Nitric,
Arsenic,
Fluoric,
Tartaric,
Citric,
Lactic,
Succinic,
Acetic,
Prussic,
Carbonic,
Ammonia.

Oxid of Mercury.
Gallic acid,
Muriatic,
Oxalic,
Succinic,
Arsenic,
Phosphoric,
Sulphuric,
Mucic,
Tartaric,
Citric,
Malic,
Sulphurous,
Nitric,
Fluoric,
Acetic,
Benzoic,
Boracic,
Prussic,
Carbonic.

Oxid of Lead.
Gallic,
Sulphuric,

(a) *Vauquelin's Table of the affinity of the metals for oxygen, according to the difficulty with which their oxids are decomposed by heat.*

(b) *Omitting the oxalic, citric, succinic, and carbonic; and adding sulphuretted hydrogen after ammonia.*

Mucic,
Oxalic,
Arsenic,
Tartaric,
Phosphoric,
Muriatic,
Sulphurous,
Suberic,
Nitric,
Fluoric,
Citric,
Malic,
Succinic,
Lactic,
Acetic,
Benzoic,
Boracic,
Prussic,
Carbonic,
Fixed oils,
Ammonia.

Oxid of Copper.
Gallic,
Oxalic,
Tartaric,
Muriatic,
Sulphuric,
Mucic,
Nitric,
Arsenic,
Phosphoric,
Succinic,
Fluoric,
Citric,
Lactic,
Acetic,
Boracic,
Prussic,
Carbonic,
Fixed alkalies,
Ammonia,
Fixed oils.

Oxid of Arsenic.
Gallic,
Muriatic,
Oxalic,
Sulphuric,
Nitric,
Tartaric,
Phosphoric,
Fluoric,
Succinic,
Citric,
Acetic,
Prussic,
Fixed alkalies,
Ammonia,
Fixed oils,
Water.

Oxid of Iron.
Gallic,
Oxalic,
Tartaric,
Camphoric,
Sulphuric,
Mucic,
Muriatic,
Nitric,
Phosphoric,
Arsenic,
Fluoric,
Succinic,
Citric,
Lactic,
Acetic,
Boracic,
Prussic,
Carbonic.

Oxid of Tin (c).
Gallic,
Muriatic,
Sulphuric,
Oxalic,
Tartaric,
Arsenic,
Phosphoric,
Nitric,
Succinic,
Fluoric,
Mucic,
Citric,
Lactic,
Acetic,
Boracic,
Prussic,
Ammonia.

Oxid of Zinc.
Gallic,
Oxalic,
Sulphuric,
Muriatic,
Mucic,
Nitric,
Tartaric,
Phosphoric,
Citric,
Succinic,
Fluoric,
Arsenic,
Lactic,
Acetic,
Boracic,
Prussic,
Carbonic,
Fixed alkalies,
Ammonia.

Ox. of Antimony.
Gallic,
Muriatic,
Benzoic,
Oxalic,
Sulphuric,
Nitric,
Tartaric,
Mucic,
Phosphoric,
Citric,
Succinic,
Fluoric,
Arsenic,
Lactic,
Acetic,
Boracic,
Prussic,
Fixed alkalies,
Ammonia.

Sulphuric Acid.
Prussic — (d).
Barytes,
Strontia,
Potass,
Soda,
Lime,
Magnesia,
Ammonia,
Glucina,
Gadolina,
Alumine,
Zirconia,
Metallic oxids.

Sulphurous Acid.
Succinic (e).
Barytes,
Lime,
Potass,
Soda,
Strontia,
Magnesia,
Ammonia,
Glucina,
Alumine,
Zirconia,
Metallic oxids.

Phosphoric Acid.
Carbonic (f).
Barytes,
Strontia,
Lime,
Potass,
Soda,
Ammonia,
Magnesia,
Glucina,
Alumine,
Zirconia,
Metallic oxids,
Silica.

Phosphor. Acid.
Lime,
Barytes,
Strontia,
Potass,
Soda,
Ammonia,
Glucina,
Alumine,
Zirconia,
Metallic oxids.

Nitric Acid.
Muriatic —(g).
Barytes,
Potass,
Soda,
Strontia,
Lime,
Magnesia,
Ammonia,
Glucina,
Alumine,
Zirconia,
Metallic oxids.

Acids
Fluoric.
Boracic (h).
Arsenic (i).
Tungstic.
Lime,
Barytes,
Strontia,
Magnesia,
Potass,
Soda,
Ammonia,
Glucina,
Alumine,
Zirconia.
Silica.

Acetic Acid.
Lactic —
Suberic — (k).
Barytes,
Potass,
Soda,
Strontia.
Lime,
Ammonia,
Magnesia,
Metallic oxids,
Glucina,
Alumine,
Zirconia.

Acids
Oxalic.
Tartaric.
Citric (l).
Lime,
Barytes,
Strontia,
Magnesia,
Potass,
Soda,
Ammonia,
Alumine,
Metallic oxids,
Water,
Alcohol.

Benzoic Acid.
White oxid of Arsenic,
Potass,
Soda,
Ammonia,
Barytes,
Lime,
Magnesia,
Alumina.

Camphoric Acid.
Lime,
Potass,
Soda,
Barytes,
Ammonia,
Alumine,
Magnesia.

Fixed Oil.
Lime,
Barytes,
Potass,
Soda,
Magnesia,
Oxid of Mercury,
Other metallic oxids.
Alumine.

Alcohol.
Water,
Ether,
Volatile oil,
Alkaline Sulphurets.

Sulphuretted Hydrogen.
Barytes,
Potass,
Soda,
Lime,
Ammonia,
Magnesia,
Zirconia.

(c) *Bergman places the tartaric before the muriatic.*
(d) *Omitting all after ammonia.*
(e) *Ammonia should come before magnesia, and strontia, glucina and zirconia should be omitted.*
(f) *Magnesia above ammonia; and omit alumine and silica.*
(g) *Ammonia should be above magnesia.*
(h) *Silica omit, and instead of it insert water and alcohol.*
(i) *Except Silica.*
(k) *Omitting strontia, metallic oxids, glucina, and zirconia.*
(l) *Zirconia after alumine.*

ELECTRICITY, (*electricitas*, from *electrum*, ελεκτροι, from ελεκλωρ, *the sun*, because of its bright shining colour; or from ελκω, *to draw*, because of its attractive power); a property which certain bodies possess when rubbed, heated, or excited, whereby they attract other bodies, and frequently send out sparks or streams of light. It pervades, and resides in metals, fluids, and other substances to which it peculiarly belongs; in the same manner as caloric, or the matter of heat, till some other body for which it has a stronger affinity is placed in, or nearly in, contact with it. The efficacy of electricity in the cure of several diseases has been supported by many very respectable authorities.

It cannot, however, be denied, that *medical electricity* has been only of late years reduced to a systematic form, and that we are in this respect particularly indebted to the labours of Tissot, Cavallo, and Bertholine. The last of these indeed, went so far as to frame a peculiar theory, according to which he derived all diseases either from the want or superabundance of the electric fluid in the human body. Nevertheless, he invented several useful instruments, and his method of applying them introduced a happy medium between the violent shocks recommended by some, and the timid practice of electrifying followed by others.

We learn, by the most satisfactory proofs, that the electric fluid operates as a stimulating remedy on the animal body, and that its effects may be produced in situations accessible to no other kind of stimulus. Its effects may be considered both as constitutional and local. Too violent shocks of it at once extinguish the vital principle, which, however, may be again kindled or excited by less powerful shocks. Hence, in speaking of its effects on the constitution, the following positions may be admitted, to a certain extent, as correct and established;—that electricity promotes the free circulation of the fluids, and particularly the blood; that it accelerates perspiration, and increases animal heat, and likewise promotes all the secretions and excretions of the body. On the other hand, the most accurate way in which we can speak of electricity, as a remedy in local affections, is that suggested by Mr. Abernethy, viz. that it has a tendency to promote *whatever action or process happens to be going on*, in a diseased part, at the *time of its application.*

In the application of this powerful remedy, the following hints may be of service, as they are the result of actual experience, and not of speculation: 1. Electricity is attended with pernicious effects in *active* or *sthenic* diseases: 2. It is hurtful when, together with relaxation and debility, an uncommonly high degree of excitability in the organs of sensation is felt, as well as in those of voluntary motion; and, 3. If a preternatural impulse of the fluids, arising from local irritation, prevail in any particular part of the body. In this case, electricity has a direct tendency to generate congestions, or the local accumulation of humours. In atonic collections of matter it is frequently found of service, when the great vital activity of the solids alone is capable of resolving the stagnations; but it is certainly detrimental, if the mechanical power of resistance in the solid parts must, at the same time, be raised; and if the accumulated matter must be previously diminished, before it can be discussed. Hence the application of electricity has sometimes been highly beneficial in promoting a regular return of the menses; but it has also, in certain cases, been attended with injurious effects.

It is of considerable advantage in passive or *asthenic* diseases, particularly in cases accompanied with a diminished susceptibility of stimuli in the organs of sensation and motion; provided that such disorder at the same time, be manifest from the periodical returns of uncommon muscular action, or by occasional excess of the sensitive faculty in any particular part. Lastly, the mode of imparting the electric fluid deserves more attention than has hitherto been bestowed upon it; and we ought never to communicate violent shocks, where less powerful ones might answer the purpose. Upon the whole, it appears to be an established maxim that, under the circumstances and conditions above specified, both the electric bath, and the gentle application of the electric fluid to any particular part of the body, are always safe; and that the extraction of sparks under similar circumstances is generally attended with advantage. The more violent methods of electrifying, on the contrary, have been productive of mischief rather than good; so that they ought to be applied to those individuals only, whose excitability is languid, or whose capacity for receiving impressions by external stimuli, is considerably diminished.

Mr. Cavallo, who has published the best treatise on Medical Electricity, entirely disapproves of giving violent shocks, and finds it most efficacious to expose the patient to the electrical aura discharged from an iron or a wooden point; or if shocks are given, they should be very slight, and not exceed 12 or 14 at a time. In this way he recommends it as effectual in a great number of disorders. The patient may be electrified from ten to twenty minutes; but if sparks are drawn, they should not exceed the number of shocks abovementioned.

1. *Rheumatic disorders*, even of long standing, are relieved, and generally quite cured, by only drawing the electric fluid with a wooden point from the part, or by drawing sparks through flannel. The operation should be continued for about twenty minutes, repeating it once or twice every day.

2. *Deafness*, except when it is occasioned by obli-

teration or other improper configuration of the parts, is either entirely or partly cured by taking sparks from the ear; or by drawing the fluid with a wooden point. Sometimes, Mr. Cavallo says, it is not improper to send exceedingly small shocks (for instance, of one thirteenth of an inch) from one ear to the other. It has been constantly observed, that whenever the ear is electrified, the discharge of wax is considerably promoted.

3. The *tooth-ach*, occasioned by cold, rheumatism, or inflammation, is generally relieved by drawing the electric fluid with a point, immediately from the part, and also externally from the face. But when the body of the tooth is affected, electrization is of no use; for it seldom or never relieves the disorder, and sometimes increases the pain to a prodigious degree.

4. *Tumours* in general, which do not contain any matter, particularly those of the scrofulous kind, are sometimes dispersed by drawing sparks, or by taking the electric fluid through flannel. The operation should be continued for five or ten minutes every day. It has been asserted, that some cases of white swellings have been quite cured by means of electricity, even after the bones and cartilages were in some measure affected.

5. *Inflammations* have occasionally been relieved by a very gentle electrization, but if far advanced, its tendency is rather to promote suppuration; agreeably to what we have already said of the disposition of electricity to forward any process that seems to be *then going on* in the part.

6. In *inflammations of the eyes*, the drawing of the electric fluid from the eye, by means of a wooden point, is often attended with great benefit; the pain being quickly abated, and the inflammation being generally dissipated in a few days. In these cases, the eye of the patient must be kept open; and care should be taken not to bring the wooden point very near it, for fear of causing a spark. Sometimes it is sufficient to draw the fluid with a metal point; for in these cases, too great an irritation should be always avoided. It is not necessary to continue this operation for three or four minutes without intermission; but after throwing the fluid for about half a minute, a short time may be allowed to the patient to rest and to wipe his tears, which generally flow very copiously; then the operation may be continued again for another half-minute, and so on for four or five times every day.

7. The *gutta serena* has been sometimes cured by electrization; but at the same time it must be confessed, it has proved ineffectual in many such cases, in which it was administered for a long time, and with all possible attention. However, it has never been known that any body was made worse by it. The best method of administering electricity in such cases, is first to draw the electric fluid with a wooden point for a short time, and then to send about half a dozen shocks, of one twentieth of an inch, from the back and lower part of the head to the fore-head, very little above the eye.

8. Some cases of *fistula lachrymalis*, which Mr. Cavallo knew to have been electrified by persons of ability, for a sufficient time, were entirely cured. The method generally practised was that of drawing the fluid with a wooden point, and taking small sparks from the part. The operation was repeated every day.

9. *Palsies* are seldom perfectly cured by means of electricity, especially when they are of long standing; but they are almost always relieved to a certain degree. The method of electrifying in those cases, is to use moderate shocks, and to draw sparks through flannel, or through the usual coverings of the part, if they are not too thick. The operation may be continued for a considerable time and often repeated.

10. *Cutaneous eruptions* have been successfully treated with electrization; but in these cases Mr. Cavallo observed, that if the wooden point be kept too near the skin, so as to cause any considerable irritation, the eruption will be caused to spread more; but if the point be kept at about six inches distance, or further, if the electrical machine be very powerful, the eruptions will be gradually diminished, till they are quite cured. The immediate and general effect of the wooden point, is to occasion a warmth about the electrified part, which is always a sign that the electrization is rightly administered.

11. The application of electricity has perfectly cured various cases of *Chorea Sancti Viti*, or *St. Vitus's dance*. In this disease shocks of about one tenth of an inch may be sent through the body in various directions, and also sparks may be taken. But if this treatment prove very disagreeable to the patient, then the shocks must be lessened, and even omitted; instead of which, some other more gentle applications must be substituted.

12. *Abscesses*, when they are incipient, and in general whenever there is any *tendency* to form matter, are dispersed by electrization. Lately, in a case of *lumbar abscess*, the disease was perfectly cured by means of electricity. See LUMBAR ABSCESS. The *sciatica* has also been often cured by it. In all such cases, the electric fluid must be sent through the part by means of two directors applied to opposite parts, and in immediate contact either with the skin, or with the coverings, when these are very thin. It is very remarkable, that the mere passage of the electric fluid, in this manner, is generally felt by the patients afflicted with those disorders, nearly as much as a small shock is felt by a person in good health. Sometimes a few shocks have been also given, but it seems more proper to omit them; because sometimes, instead of dispersing, they rather accelerate the formation of matter.

13. *Nervous head-achs*, even of a long standing,

have been cured by electrization. In this disease, the electric fluid must be drawn with a wooden, and sometimes even with a metal point, all round the head successively. Sometimes exceedingly small shocks have been administered: but these can seldom be used, because the nerves of persons subject to this disease are so very irritable, that the shocks, the sparks, and sometimes even the drawing the electric fluid with a wooden point kept very near the head, throw them into convulsions.

14. The *gout*, extraordinary as it may appear, Mr. Cavallo asserts, has certainly been cured by means of electricity, in various instances. The pain has been generally mitigated, and sometimes the disease has been removed so as not to return again. In those cases, the electric fluid was drawn by means of a wooden point, although sometimes, when the pain was too great, a metal point only was used.

15. *Agues* have not unfrequently been cured by electricity, so that sometimes one electrization or two have been sufficient. The most effectual and sure method has been that of drawing sparks through flannel, or the clothes, for about ten minutes, or a quarter of an hour. The patients, it appears, may be electrified either at the time of the fit, or a short while before the time in which it is expected.

16. The *suppression of the menses*, in the female sex, is often successfully treated by means of electricity, even when the disease is of long standing, and after the most powerful medicines used for it have proved ineffectual. The cases of this sort in which electrization has proved useless are so few, and the successful ones so numerous, that the application of electricity for this disease may be justly considered as a valuable remedy. Some attention is required, to distinguish the arrest of the menses from a state of pregnancy; as in the latter, electricity may be attended with very disagreeable effects. Pregnant women, however, may be electrified for other diseases, but always using very gentle means, and directing the electric fluid through other parts of the body distant from those subservient to generation. In the real suppression of the menses, Mr. Cavallo directs small shocks, *(i. e.* of about one twentieth of an inch), may be sent through the pelvis; sparks may be taken through the clothes from the parts adjacent to the seat of the disease; and also the electric fluid may be transmitted by applying the metallic or wooden extremities of two directors to the hips, in contact with the clothes; part of which may be removed in case they be too thick. Those various applications of electricity should be regulated according to the constitution of the patient. The number of shocks may be about 12 or 14. The other applications may be continued for two or three minutes; repeating the operation every day. But either strong shocks, or a stronger application of electricity than the patient can conveniently bear, should be carefully avoided; for by those means, sometimes more than a sufficient discharge is occasioned, which is not very easily remedied. In cases of uterine hæmorrhage, it is not known that the application of electricity was ever beneficial.

17. In the *venereal disease*, electrization has been generally forbidden; having commonly increased the pains, and other symptoms, rather than diminished them. Indeed, considering that any sort of stimulus, but that of mercury, has been found hurtful to persons afflicted with that disorder, it is no wonder that electricity has produced some bad effects, especially in the manner it was administered some time ago, viz. by giving strong shocks. But whether the direct application of this stimulus be desirable or not in the treatment of *venereal symptoms*, there is a great singularity attends its use in those persons who are *under the effects of a mercurial course.* In these, the shock, or even the spark, is attended with *considerably more pain* than in common instances; and the late Mr. Hunter, in his Treatise on the Venereal Disease, mentions the case of a person on whose complaint electricity had no effect, *till* mercury was administered, *after which* the same remedy produced a cure. Would not a previous mercurial course, therefore, in some cases (particularly of the *atonic* kind) give unexpected efficacy to electrization?

The application of electricity has been found also beneficial in some other diseases besides those mentioned above. Mr. Cavallo indeed mentions several which we have thought it necessary to omit, the facts not being sufficiently numerous to afford the deduction of any general rules of practice in those instances. Dr. Fricke, of Brunswick, has lately made several successful attempts to destroy the *tape-worm*, and expel it, by the aid of electricity. The proper application of the electric fluid, according to his account, almost instantaneously relieves the most violent symptoms. In applying electricity to individuals suspected to have the tape-worm, Dr. F. uses a conductor with a globe of two inches and a half in diameter, from which he causes the sparks to strike against a globe of an insulated *scintillometer:* these sparks he passes in different directions through the abdomen; but, at first, admits them only from three to four inches long. As soon, however, as the patient can conveniently bear this kind of vibration, sparks to the length of from ten to twelve inches are admitted: and the more powerful these are, the more speedy will be the relief. As the symptoms of the tape-worm usually begin with severe tension and oppression about the region of

the stomach, the first sparks are directed through the pit of the stomach, in a straight line towards the vertebræ. After several sparks have been administered, eructations frequently take place; the patient feels much relieved in that particular part, but generally perceives the motion of another part of the worm, in some other place. Thither the sparks are again directed, and the worm is incessantly pursued, until it can be distinctly felt by the patient like a heavy weight. At this time it is in a state to be expelled by some active purgative.

It is proper, in conclusion, to observe, that, in applying *electricity*, the different auxiliary remedies known to medical practitioners, are by no means to be forgotten. Indeed this remedy is, at best, too uncertain and capricious for us to place implicit confidence in it; and whilst its powers are *now and then* displayed in most *wonderful* instances, we are liable to repeated disappointments in employing it even in the most simple cases of local disease.

In what respects the effects of electricity differ from those of Galvanism is as yet unascertained. Some remarks on this head occur under GALVANISM.

ELE'CTRUM, (ελεκτρον), *amber;* so called by the ancients. See AMBER.

ELECTUARY, or ELECTARY, in pharmacy, a form of medicine composed of powders and other ingredients, incorporated with some conserve, honey, or syrup. Vossius observes, that all the remedies prescribed for the sick, as well as the confections taken by way of regale, were called by the Greeks εκλειγματα, and εκλεικτα, of the verb λειχω, "*I lick*;" whence, says he, was formed the Latin *electarium*, and afterwards *electuarium*. This conjecture he supports from the laws of Sicily, where it is ordained, that *electuaries*, syrups, and other remedies, be prepared after the legal manner. The Bollandists, who relate this etymology, seem to confirm it.

Electuaries receive chiefly the milder alterative medicines, and such as are not ungrateful to the palate. The more powerful drugs, as cathartics, emetics, opiates, and the like, (except in officinal electuaries to be dispensed by weight), are seldom trusted in this form, on account of the uncertainty of the dose: disgustful ones, acrids, bitters, fetids, cannot be conveniently taken in it; nor is the form of an electuary well fitted for the more ponderous substances, as mercurials, these being apt to subside on keeping, unless the composition be made very stiff.

The lighter powders require thrice their weight of honey, or syrup boiled to the thickness of honey, to make them into the consistence of an electuary: of syrups of the common consistence, twice the weight of the powder is sufficient. Where the common syrups are employed, it is necessary to add likewise a little conserve, to prevent the compound from candying and drying too soon. Electuaries of Peruvian bark, for instance, made up with syrup alone, will often in a day or two grow too dry for taking. This is owing to the crystallization of the sugar. Deyeux, therefore, advises electuaries, confections, and conserves, to be made up with syrups from which all the crystallizable parts have been separated. For this purpose, after being sufficiently evaporated, they are to be exposed to the heat of a stove as long as they form any crystals. The syrup which remains, probably from the presence of some vegetable acid, has no tendency to crystallize, and is to be decanted and evaporated to a proper consistence. In hospital practice, the same object may be obtained much more easily by using molasses instead of syrups.

The quantity of an electuary, directed to be administered at a time, in extemporaneous prescription, varies according to its constituent parts; but it is rarely less than the size of a nutmeg, or more than two ounces.

ELEMENTS, or ELEMENTARY SUBSTANCES. Philosophers in all ages have been of opinion, that notwithstanding the great diversity of the bodies of nature, they are all composed or constituted of a few primary simple substances, to which they have given the name of *elements*, *principles*, or *radicals*. If, however, we attentively consider the systems which have been successively formed by them, relative to the number and nature of the elements of bodies, we shall be astonished at the great variety which prevails in their opinions on the subject. In the more early periods every one appears to have taken his own imagination as his guide; and no reasonable system seems to have been established until the time when Aristotle and Empedocles acknowledged as elements, air, water, earth, and fire. Their opinion was well received for many ages; and it must be allowed that it was calculated to seduce the mind. For, in fact, there are enormous masses, and inexhaustible stores, that present themselves to our view, of these four principles, to which the destruction or decomposition of bodies seemed to refer all the several component parts which formation or creation had taken from them. The importance and authority of those great men who had adopted this system, and the analyses of bodies which presented only these four principles, also afforded grounds for admitting the doctrine. As soon, therefore, as chemistry had advanced so far as to discover the principles of bodies, the cultivators of that science presumed to mark the number, nature, and character of the elements; and every body that was unalterable by the chemical methods of decomposition then employed, was considered by them as a simple or elementary principle. By thus taking the limits of analysis as the term for indicating the elements, the number and the nature of these must vary according to the changes and the progress of

the science. This has accordingly happened, as may be seen by consulting the authors who have written on the subject, from the time of Paracelsus to the present period.

If, however, immutability of properties, unity, and simplicity, be the general characteristics of elements; and if that simplicity of character belong only to such bodies as we cannot reduce by decomposition, it must be observed, that of the four elements, there are two, air and water, which art has at length found means to decompose and separate into several principles; that elementary earth is merely the creature of fancy, as there are a variety of earthy substances all equally simple and incapable of decomposition; and that there are many natural bodies, such as sulphur, carbon, and the metals, which no art has yet been able to decompose, which must therefore, in the present state of our knowledge, be considered as simple substances or bodies. From these considerations, it appears, that the two principles, or primary elements of natural bodies, escape the observation both of our senses and of those instruments which we employ to hide the imperfection of them; that many of those substances which have been called elements on account of their bulk, their influence on the phenomena of nature, and their being found to exist in many of its productions, are far from being simple and unchangeable: and that, in truth, none of the bodies with which we are acquainted is a simple substance, though we may ascribe that character to such as we have not hitherto been able to decompose. It is therefore evident that the denomination of *elements* ought to be effaced from a chemical nomenclature; or rather it ought not to be used but as an expression denoting the last term of our analytical results; and it is always in this sense that it is employed in the modern treatises on chemistry.

The bodies which are known to us at present, which may be exhibited in their simple state, uncombined with other matters, are termed, by a late writer, the *ostensible*, *producible*, *simple substances*, to distinguish them from those whose existence or presence is only inferred from facts, and which are called *unostensible* and *unproducible*. The following list of them is added under these titles:

Unproducible simple Substances.

1. Phlogiston, or the basis of light.		11. Radical of gold.
2. Oxygen.		12. ——— platina.
3. Hydrogen.		13. ——— silver.
4. Azotic	Radical.	14. ——— mercury.
5. Carbonic	Radical.	15. ——— lead.
6. Sulphuric	Radical.	16. ——— copper.
7. Phosphor.	Radical.	17. ——— iron.
8. Muriatic	Radical.	18. ——— tin.
9. Fluoric	Radical.	19. ——— zinc.
10. Boracic	Radical.	20. ——— bismuth.
		21. ——— antimony.
		22. Radical of nickel.
		23. ——— cobalt.
		24. ——— arsenic.
		25. ——— mangan.
		26. ——— molybd.
		27. Radical of wolfram.
		28. ——— uranium.
		29. ——— titanium.
		30. ——— tellurium.
		31. ——— chromium.

Producible*, ostensible, simple Substances.*

32. Caloric.		37. Strontian	earth.
33. Siliceous	earth.	38. Argillaceous	earth.
34. Calcareous	earth.	39. Glucine.	earth.
35. Magnesia	earth.	40. Vegetable	alkali.
36. Ponderous	earth.	41. Mineral	alkali.

ELEMI, (ELEMI; said to be its Ethiopian name); gum elemi. This resin is supposed to be the produce of the *Amyris elemifera; foliis ternis quinato-pinnatisque subtus tomentosis*, Linn. Gum Elemi is brought hither from the Spanish West Indies. It is most esteemed when softish, somewhat transparent, of a pale whitish colour, inclining a little to green, and of a strong, though not unpleasant smell. Dr. Wright says, that on wounding the *bursera gummifera*, a thick milky liquor flows, which soon concretes into a resin no way different from the elemi of the shops. Of 100, 94 parts dissolve in alcohol, and some of its fragrance rises along with this menstruum in distillation. When distilled with water, it yields 6.4 of pale-coloured, thin, fragrant, essential oil. Its only constituents, therefore, are resin and essential oil. It gives name to one of the officinal unguents, and is at present little otherwise made use of; though it is certainly preferable for internal purposes to some others which are held in greater esteem.

Unguentum Elemi. Lond. Dubl.

Take of Gum Elemi, one pound;
Turpentine, ten ounces;
Mutton suet, prepared, two pounds;
Olive oil, two ounces.

Melt the elemi with the suet; and, having removed it from the fire, mix with it immediately the turpentine and oil; after which strain the mixture.

This ointment, formerly known by the name of *Linimentum Arcæi*, has long been used for digesting, cleansing, and incarnating ulcers; and for these purposes it is preferred by some to all other compositions of this kind.

ELEOSELINUM, (ελεοσελινον; from ελος, *a lake*, and σελινον, *parsley*). See APIUM.

ELEPHANTIA ARABUM. According to some writers, this is the *Elephantiasis*, where the feet are swelled and hard. In Dr. Cullen's Nosology, it is synonymous with ELEPHANTIASIS, which see.

ELEPHANTIASIS, (ελεφαντιασις; from ελεφας, *an elephant*: so named from the legs of people af-

fected with this disorder, growing scaly, rough, and wonderfully large, like the legs of an elephant), or ELEPHAS; a disease that attacks the whole body, but mostly affects the feet, which appear somewhat like those of the elephant. Dr. Cullen makes it a genus of disease in the class *cachexiæ*, and order *impetigines*. The first symptom is generally a sudden eruption of tubercles, or bumps of different sizes, of a red colour, more or less intense, attended with heat and itching. Sometimes it attacks the face and neck alone, at other times it occupies the limbs only. The patient is feverish; the fever ceasing, the tubercles remain indolent, and in some degree scirrhous, of a livid or copper colour, but sometimes of the natural colour of the skin, or at least very little altered; and sometimes they, after some months, ulcerate, discharging a fœtid ichorous humour in small quantity, but never healthy pus.

The features of the face swell and enlarge greatly, the parts above the eye-brows seem inflated; the hair of the eye-brows falls off, as does the hair of the beard; but Dr. Heberden, who gives the most circumstantial account of this disease, never saw any one whose hair did not remain on his head. The *alæ nasi* are swelled and scabrous; the nostrils patulous, and sometimes affected with ulcers, which, corroding the cartilage and *septum nasi*, occasion the nose to fall. The lips are tumid; the voice is hoarse; which symptom has been observed when no ulcers have appeared in the throat, although sometimes both the throat and gums are ulcerated. The ears, particularly the lobes, are thickened, and occupied by tubercles. The nails grow scabrous and rugose, appearing somewhat like the rough bark of a tree; and the distemper advancing, corrodes the parts gradually with a dry sordid scab or gangrenous ulcer; so that the fingers and toes rot and separate joint after joint. In some patients, the legs seem rather posts than legs, being no longer of the natural shape, but swelled to an enormous size, and indurated, not yielding to the pressure of the fingers; and the superfices is covered with very thin scales, of a dull whitish colour, seemingly much finer, but not so white, as those observed in the *lepra Græcorum*. The whole limb is overspread with tubercles, interspersed with deep fissures; sometimes the limb is covered with a thick moist scabby crust, and not unfrequently the tubercles ulcerate. In others the legs are emaciated, and sometimes ulcerated; at other times affected with tubercles without ulceration. The muscular flesh between the thumb and fore finger is generally extenuated.

The whole skin, particularly that of the face, has a remarkably shining appearance, as if it were varnished or finely polished. The sensation in the parts affected is very obtuse, or totally abolished; so that pinching, or puncturing the part, gives little or no uneasiness: and in some patients, the motion of the fingers and toes is quite destroyed. The breath is very offensive; the pulse in general weak and slow.

The disease often attacks the patient in a different manner from that above described, beginning almost insensibly; a few indolent tubercles appearing on various parts of the body or limbs, generally on the legs or arms, sometimes on the face, neck, or breast, and sometimes in the lobes of the ears, increasing by very slow degrees, without any disorder, previous or concomitant, in respect of pain or uneasiness.

To distinguish the species from their manner of attacking the patient, Dr. Heberden styles the first by *fluxion*, and the other by *congestion*. That by fluxion is often the attendant of a *crapula*, or surfeit from gross food; whereby, perhaps, the latent seeds of the disorder yet dormant in the mass of blood are excited; and probably, from frequent observations of this kind (the last meal always having the blame laid on it), it is, that, according to the received opinion, either fish (the tunny, mackarel, and shell-fish, in particular), melons, cucumbers, young garden beans, or mulberries, eaten at the same meal with butter, cheese, or any preparation with milk, are supposed to produce the disease, and are accordingly religiously avoided.

Violent commotions and agitation of the mind, as anger, fear, and grief, have more than once been observed to have given rise to the disorder: and more frequently, in the female sex, a sudden suppression of an accustomed evacuation, by bathing the legs and feet in cold water at an improper season.

The elephantiasis that occurs by fluxion is the oftenest remedied by timely applications: that by congestion, not being so conspicuous, is generally either neglected or attempted to be concealed, until perhaps it be too late to be cured; or at least not without a longer course of medicine and stricter regimen than patients are commonly inclined to adopt. Several incipient cases by fluxion have been known to yield to an antiphlogistic method, as bleeding, refrigerant salts, the saline draughts, and a solution of crystals of tartar in water, for common drink; and when once the fever is overcome, the Peruvian bark combined with sassafras, we are told, is the remedy principally to be relied on. The only topical medicine prescribed by Dr. Heberden, was an embrocation of brandy and alkaline salts. By the same method some confirmed cases have been palliated. But, except in one patient, the doctor says, he never saw or heard of a confirmed elephantiasis radically cured. He adds, however, that he never met with another patient possessed with prudence and perseverance enough to prosecute the cure as he ought.

Dr. Temple, in the treatment of this disease, advises the warm bath, issues, and the following embrocation, probably from the preceding hints:

℞ Spt. vin. ten. ℥viiij.
Aq. kali ℥j.
Aquæ ammoniæ ℥ij. M. fiat Embrocatio.

The following, he also says, may be tried internally:

℞ Calomel. ppt.
Sulph. antimon. præcipit. aa ℈j.
Mic. panis q. s.
Misce fiant pill. No. xx. capiat j. vel ij. mane et vespere quotidie.

That exploded remedy, the flesh and fat of vipers, it appears, has been lately re-introduced into practice, and said to be of service in this disease. *White arsenic* is recommended as a cure for the elephantiasis, in the Asiatic Researches. Every practitioner, however, should be extremely cautious of employing this dangerous remedy, either in this or any other case. When it is employed, however, we are disposed to recommend that the *arseniate of potass* should have the preference to all other formulæ. See Arsenicum.

ELE'TTARI PRIMUM. See Amomum verum.

ELEUTHE'RIA BARK. See the article Cascarilla.

ELEUTHE'RIÆ CORTEX. See the article Cascarilla.

ELEVA'TOR, (from *elevo*, to lift up). A muscle is so called whose office is to lift up the part to which it is attached. It is also the name of a chirurgical instrument with which surgeons raise any depressed portions of bone, but chiefly those of the cranium, in the operation of trepanning.

ELEVA'TOR LA'BII SUPERIO'RIS PRO'PRIUS. See Levator labii superioris alæque nasi.

ELEVA'TOR LA'BII INFERIO'RIS PRO'PRIUS. See Levator labii inferioris.

ELEVA'TOR LABIO'RUM COMMU'NIS. See Levator anguli oris.

ELIOCHRY'SUM, (ηλιοχρυςον; from ελιος, *the sun*, and χρυσος, *gold:* so called from their shining yellow appearance), or *Stœchas citrina*, goldilocks; a small downy plant, the *Gnaphalium stachas*, Linn. The flowers of this are warm, pungent, and bitter, and have been thought to possess aperient and corroborant virtues, but it is now neglected.

ELI'XIR, (from elekser, an Arabic word, signifying *quintessence)*. This term was formerly applied to many preparations similar to our compound tinctures, but is now very little employed.

ELLE'BORUM. See Helleborus albus.

ELLI'PSIS, a curved line returning into itself, and produced from the section of a cone by a plane cutting both its sides, but not running parallel to the base.

ELM. See Ulmus.

ELM-LEAVED SUMACH. See Sumach.

ELO'DES (from ελος, a *swamp*, or *marsh)*, a species of Tritæophya, or remittent fever; epidemic, but not contagious, and, through its course, attended with profuse sweating.

ELONGATION, in anatomy, the spreading out, or extension, of a part, beyond its natural dimensions.

ELUTRIATION, in chemistry, an operation performed by washing powdered substances with water, stirring them well together, and hastily pouring off the liquid, while the lighter part remains suspended in it, that it may thereby be separated from the heavier part. By this operation metallic ores are separated from earth, stones, and other unmetallic particles adhering to them.

ELVE'LLA, turban-top; a genus in Linnæus's botany, of the order of *Fungi*. He enumerates but two species.

ELYTROCE'LE, (ελυτροκηλη; from ελυτρον, *the vagina*, and κηλη, *a tumor)*; a hernia of the superincumbent viscera, protruding into the vagina.

ELYTROI'DES, (ελυτροειδης; from ελευτρον, *a sheath*, and ειδος, *form)*. The tunica vaginalis is so called by some writers, because it includes the testis like a sheath.

ELY'TRON, (ελυτρον, from ειλυω, *to involve*, or *cover)*; a covering or sheath. Hippocrates calls the membranes which involve the spinal marrow, ελυτρα.

EMA'NSIO ME'NSIUM. The language used by some Latin writers, to signify the backward appearance or retention of the menses: that is, when they do not begin to flow at the period of life at which they may be expected.

EMARGINA'TUS, in botany. A leaf of a plant which is hollowed, or notched, at its extremities, so as to form a heart, is called an *emarginated* leaf. See Botany.

EMASCULATION, the act of castrating; or depriving a male of those parts which characterise his sex. See Castration.

EMBALMING; the opening of a dead body, taking out the intestines, and filling the place with odoriferous and desiccative drugs and spices, to prevent its putrefying. The Egyptians excelled all other nations in the art of preserving bodies from corruption; for some that they have embalmed upwards of 2000 years ago, remain whole to this day, and are often brought into other countries as great curiosities. Their manner of embalming was thus: they scooped the brains with an iron scoop out at the nostrils, and threw in medicaments to fill up the vacuum: they also took out the entrails,

and having filled the body with myrrh, cassia, and other spices proper to dry up the humours, they pickled it in nitre, where it lay soaking for 70 days. The body was then wrapped up in bandages of fine linen and gums, and so was delivered to the kindred of the deceased, entire in all its features, the very hairs of the eye-lids being preserved. They used to keep the bodies of their ancestors, thus embalmed, in little houses magnificently adorned, and took great pleasure in beholding them, alive as it were, with little change in their size, features, or complexion. The Egyptians also embalmed birds, &c. The prices for embalming were different; the highest was a talent, the next 29 minæ, and so decreasing to a very small matter: but they who had not wherewithal to answer this expense, contented themselves with infusing, by means of a syringe, through the anus, a certain liquor extracted from the cedar; and, leaving it there, wrapped up the body in cerecloth. The oil thus preserved the intestines, which dried, and were not in the least putrefied: the body being enclosed in resin, also grew dry, and nothing remained besides the skin glued upon the bones.

The method of embalming used by the modern Egyptians, according to Maillet, is to wash the body several times with rose-water, which, he elsewhere observes, is more fragrant in that country than with us; they afterwards perfume it with incense, aloes, and a quantity of other resins, of which they are by no means sparing; and then they bury the body in a winding sheet, made partly of silk and partly of cotton, and soaked, as is supposed, with some sweet-scented oils or liquid perfume, though Maillet uses only the term *moistened;* this they cover with another cloth of unmixed cotton, to which they add one of the richest suits of clothes of the deceased. The expense, he says, on these occasions, is very great, though nothing like what the genuine embalming cost in former times.

The principle of embalming depends either on the absorption of the fluids of the body, or the impregnation of them with some substance which will preserve the solids from putrefaction. Hence absorbing powders have been used, and also nitre, which powerfully acts on the flesh, though, like all other saline matter, it tends to prevent the body from drying. Dr. Hunter recommended the injecting of oil of turpentine impregnated with camphor and other aromatic gums into the blood vessels, which is a very rational method.

EMBO'THRIUM, a genus in Linnæus's botany. He enumerates two species.

EMBROCATION, *(embrocatio,* derived from εμβρεχω, *to moisten or soak in),* a name given, in pharmacy, to a fluid application to rub any part of the body with. Embrocations are generally used for the same purposes as liniments (see LINIMENTS), but differ from the latter in being thinner.

E'MBRYO, (εμβρυων, from εμβρυω, *to bud forth);* in physiology, the first rudiments of an animal in the womb, before the several members are distinctly formed: after the latter period it is denominated a *fœtus.* See CONCEPTION, and FŒTUS.

EMBRYOTO'MIA, (εμβρυοτομια; from εμβρυω, *a fœtus,* and τεμνω, *to cut); embryotomy;* or the separating of the parts of the fœtus *in utero,* in order to extract it, when circumstances render its natural birth impossible.

Dr. Denman says, the chief object is to lessen the head. This operation consists of three parts: 1. Perforating the cranium. 2. Evacuating the brain. 3. Extracting the head. Three instruments have formerly been used for these purposes: the scissars of La Motte, altered and improved by Smellie; an implement in the form of a large spoon, with serrated edges; and, thirdly, a hook or crotchet, either straight or curved, which was either used singly, or in pairs like the *forceps.* But in the place of these, Dr. Denman introduced the use of two instruments: the first a Perforator in the form of Smellie's scissars, the blade slightly curved in the manner of the scissars used for extirpating the tonsils, but without any cutting edge; secondly, a crotchet, with a slight degree of curvature and a very small hook, if compared with those before used. The first measures about nine inches, and has a stop on each blade, one inch and a quarter from the point. The crotchet, which has a wooden handle and a flat stem, when properly curved, is of an equal length with the perforator. These instruments are now in general use. SEE MIDWIFERY.

In describing the manner in which the perforation of the child's head is to be attempted, Dr. Denman says, "The ease or difficulty attending this and every other part of the operation, will depend upon the distance the head may be from us; whether, for instance, it be descended and locked in the *pelvis,* or lying at the superior aperture; and upon the degree of distortion of the *pelvis,* which may be only so much as just to prevent the passage of the head, or so great as to render the use of the instruments both troublesome and dangerous. Some inconvenience may also be produced by the *os uteri,* should it not be completely dilated; but this may rather be esteemed a reason for extraordinary care than as a cause of difficulty.

"Without regard to the part of the head which we mean to perforate, but deciding upon that which is most obvious and easy of access, as the most proper, the left hand, flattened, is to be introduced into the *vagina,* and the fore finger of the same hand is to be directed upon that part of the head where we intend to fix the point of the instrument. The perforator, held in the right hand, is to be conducted with the convex part towards the palm of the left hand, and with the point kept close to the fore finger, till it reaches the part where

we have determined to perforate. The fore finger of the left hand is then to be passed round the point of the instrument, that we may be assured we have fixed it in the right place, and that none of the soft parts of the mother are in the way of being hurt. With the instrument held firmly in the right hand, we must press through the integuments of the head; and, the point being fixed upon the bones of the *cranium*, begin to perforate, by turning with a semirotatory motion the handle of the instrument. This motion of the instrument, care being taken to confine the point to the place where it was originally fixed, is to be continued till we judge the bone to be actually perforated; and we are to try occasionally, by advancing the instrument, whether the bone be perforated or not. When the bone is perforated, the instrument being pressed forwards will penetrate the head, and go on till it reaches the stops formed upon the blades. Then, fixing the finger and thumb of the right hand in the bows of the handle, or pressing the thick part of the hand between the stems, or calling for the help of an assistant, we should separate the handles of the instrument to such a distance as to make a slit or opening of sufficient length in the *cranium;* judging of, and in some measure guiding, the effect produced upon the blades, by the separation of the handles, and by the finger of the left hand retained in its primitive position. The handles being then closed, the instrument must be turned in a transverse direction, and they are again to be separated in the same cautious manner, by which means a crucial opening of a proper size will be made in the *cranium*. This being completed, the Perforator is to be closed, and withdrawn in the same cautious manner in which it was introduced."

In this part of the operation, Dr. Denman states as the principal objects for our attention: 1. That the instrument be carefully introduced. 2. That we be not alarmed at the discharge which follows the perforation of the integuments of the head, as that is to be expected. 3. That we do not allow the point of the instrument to slip while we are perforating. 4. That the crucial opening in the *cranium* be made sufficiently large, to allow of the discharge of its contents.

The contents of the head may be safely and effectually evacuated by the handle of a silver spoon, or by introducing the crotchet into the opening in the *cranium*, and turning it round frequently, in various directions, especially near the basis of the skull.

When the head of the child has been lessened, Dr. Denman says, the length of time during which the patient may be trusted in expectation of favourable changes, must be left to the judgment that may be formed of every individual case which may be the immediate object of practice. In some cases, from the precarious state of the mother, there will exist a necessity of extracting the head as speedily as we can with safety; yet the general principle to be established is, that the longer we have waited in any case, the more easily will the head be afterwards extracted. But still, the patient is to be carefully watched that we do not wait too long, lest unfavourable symptoms should come on, and the end for which the operation was performed be ultimately defeated.

Sooner or later then, according to the state of the mother, it will be necessary to make some efforts to extract the head of the child; but these depend so entirely on existing circumstances, and on the skill and ingenuity of the operator, that little profit can be derived from any written instructions on the subject. Dr. Denman recommends as much to be done with the fingers as possible, and as little with sharp instruments; repeating the attempts to extract such portions of the fœtus as lie favourably for it, at intervals, when the natural efforts of the mother return.

"Should the head of the child," says he, "be so high in, or above, the superior aperture of the *pelvis*, or this last be so much distorted as not to admit of my giving this kind of assistance, or should it be unequal to the purpose, I carefully introduce the crotchet, guided by my left hand, into the opening in the head; and, fixing the point of the hook as far from the edge of the bone as its curvature will allow, I begin to pull moderately by the handle held in my right hand, guiding at the same time the hook of the crotchet with the fingers of the left, if it should happen to tear away the bone, or slip.

"If on trial the crotchet be found firmly fixed, but the head be too much impacted in the *pelvis* to be brought down with the force first used; that is, supposing the force required to extract the head be equal to 10, and the force which can be exerted by the crotchet not to exceed 5; no other purpose can be answered by striving too earnestly with the force which cannot be made to exceed 5, except tearing away the piece of bone in which the crotchet may be fixed, which does not facilitate the operation. We are to be satisfied with the steady exertion of the force 5, which, being continued, will at length be found sufficient for our purpose, the resistance gradually diminishing, and the force 5 remaining. In the repetition of our attempts to extract the head, which must be made at intervals, should the bone in which the instrument was fixed, be loosened and come away, wholly or in part, the crotchet must be again introduced and fixed in another place, and the same method of proceeding followed; remembering also when we extract, to pull with some variation in the direction, but always in the line, of the cavity of the *pelvis*. In almost every case of difficulty, the principal obstacle or cause of the difficulty is at one particular part of

the *pelvis*, and when the head has passed that part, there is no farther occasion for using much force; and we are afterwards to proceed very circumspectly, that there may be no laceration of, or injury done to, the parts of the mother."

If the disproportion between the cavity of the *pelvis* and the head of the child be very great, we may allow it to be possible, that the bones of the *cranium* may be brought away, and yet the body of the child remain above the superior aperture of the *pelvis*, with *absolute inaction of the uterus*: this will require a different method of treatment. If the space between the projecting bones of the *pelvis* would permit the flattened hand to be passed into the *uterus*, it might be most expedient to turn the child and deliver by the feet, which, thus situated, Dr. D. has more than once done. "But, if the distortion of the *pelvis* will not allow the hand to pass into the *uterus*, or if there be reason to apprehend mischief to the *uterus*, from the jagged or loosened pieces of bone, the crotchet must be again introduced, and fixed upon the chest of the child, where it may probably meet with some part that will bear a sufficient degree of force for extracting it. Should this not be the case, the crotchet must be repeatedly tried, by which the contents of the *thorax* and *abdomen* may be evacuated, and the general bulk of the child's body very much lessened. Then, trying to fix the hook of the instrument on some part of the spine, or bringing down the arms, we shall at length succeed, and extract the body of the child, either whole or in parts."

Women generally recover well after this operation, if not delayed too long, and performed with care. The treatment proper for all women in child-bed is necessary, and it will be incumbent upon us also to be particularly careful that the urine be voided, either by the natural efforts, or by the use of the catheter, within a short time after the delivery. The use of the latter method is also to be continued, twice in the course of twenty-four hours, till the woman may become able to expel the urine herself; lest there should be inflammation on any part of the bladder or *meatus urinarius*, and a slough to be cast off, which, unless it were merely a small portion of the *meatus*, might be followed by an involuntary discharge of urine; which is a most miserable inconvenience entailed on the unfortunate patient for life.

In the Memoirs of the Medical Society of London, Vol. II. Mr. Lucas of Leeds has suggested a mode of superceding the necessity for embryotomy, in cases where it otherwise is to be expected. His method is, to enjoin, during pregnancy, *a strict adherence to an abstemious diet;* by which, after many trials, he has found the child to be considerably smaller than it otherwise would be, and consequently more easily delivered through a narrow or distorted *pelvis*.

EMBRYULCUS, (from εμϐρυον, *a fœtus*, and ελκω, *to draw);* a hook for the extraction of a child, when labour is difficult. The term applies not only to the *blunt-hook*, little used at present, but also to the *vectis*, *forceps*, &c. and even to the means used in *embryotomy*. See those articles. The operation of extraction by these instruments is termed *embryulcia*.

EMERSION, in physics, the rising of any solid above the surface of the fluid superficially heavier than itself, into which it had been violently immerged or thurst. It is one of the known laws of hydrostatics, that a lighter solid being forced down into a heavier fluid, immediately endeavours to emerge; and that with a force or moment equal to the excess of weight of a quantity of the fluid above that of an equal bulk of the solid. Thus, if a solid be immerged in a fluid of double its specific gravity, it will emerge again till half its bulk or body be above the surface of the fluid.

EMERY, a rich iron-ore found in large masses of no determinate shape or size, extremely hard, and very heavy. It is usually of a dusky brownish red on the surface; but when broken, is of a fine bright iron-grey, but not without some tinge of redness; and is spangled all over with shining specks, which are small flakes of a foliaceous talc, highly impregnated with iron. It is also sometimes very red, and then usually contains veins of gold. It makes no effervescence with any of the acid menstruums; and is found in the island of Guernsey, in Tuscany, and many parts of Germany. Dr. Lewis is of opinion, that some kinds of emery contain *platina*.

EMETICA, (εμετικα, from εμεω, *to vomit);* EMETICS. These are medicines which excite vomiting, and thereby evacuate the stomach of its contents, whatever these may be. As he does upon other subjects, so Dr. Cullen first mentions what may be their effects in general or in particular, and afterwards says by what means these are to be obtained. Some physicians have been of opinion, that the action of vomiting, and the evacuation of the stomach, may be useful to persons in health. The moderate practice of this, Dr. Cullen says, may possible be useful, both by its exciting the activity of the stomach itself, and by agitating the whole body: but he is certain that the practice ought not to be frequent; and has known instances of unnecessary vomits being hurtful, by rendering the stomach less fit to retain the aliment, and even weakening its powers of digestion.

It is different, however, when the contents of the stomach are in a morbid state, and noxious to the stomach itself, or to the whole system; in this case, there can be no question about the propriety of vomiting, except in a few cases, when the action itself may be hurtful to other parts of the body, or when the vomiting cannot be excited but with such

straining as may be detrimental to the parts especially concerned in vomiting. But when the contents of the stomach are morbid and no such exceptions as those abovementioned present themselves, it will always be proper to excite vomiting, not only for throwing out the noxious matters, but, frequently also, as these last may become ferments to the aliments afterwards taken in.

The symptoms of a foul stomach (as it is popularly called), or of the contents being offensive either in quality or quantity, are especially the want of the usual appetite, and often not only this, but a loathing of food; or, when aliments are taken in, an uneasiness in the time of their digestion, and marks of its imperfect condition, such as heartburn, flatulency, and acid eructations; and to these may be added frequent headachs. These circumstances indicate the use of vomiting and the evacuation of the present contents of the stomach, which gives generally more or less relief; but it is very necessary to observe, that this relief is seldom very durable, as the accumulation of noxious matters in the stomach is more frequently to be considered as an effect than a cause: for the production of them very commonly depends upon a loss of tone in the muscular fibres of the stomach, which is not to be effectually cured by vomiting, though the effects of it may be relieved by it for a longer or shorter time. Dr. Cullen, however, laments the probable consequences, to those who trust to this mode of relief, and have therefore frequent recourse to it; for much experience convinced him, that frequent vomiting hurts the tone of the stomach, and often makes the symptoms of indigestion recur more frequently.

"The effects of vomiting", he says, "and the degree of disease that requires it, are commonly judged of, both by the vulgar, and even by physicians, (though not always fairly), by the appearance of the matter thrown up. For example, there is commonly thrown up a considerable quantity of very viscid mucus; and to this the symptoms of the disease are frequently imputed.

"It is indeed possible, that an unusual accumulation of mucus in the stomach may be the cause of the want of appetite and other symptoms of indigestion, but not always so justly as might be imagined. The mucous follicles of the stomach constantly pour out a considerable quantity of this matter; a considerable quantity of it is to be found in the stomachs of the most healthy persons: and the experiments of Mr. Senac show, that there is always a considerable quantity of it in the mucous follicles, which may be squeezed out very copiously in vomiting. It is not therefore to be judged, that even a large quantity, thrown up by vomiting, had either previously existed in the stomach, or that such a mucus had been the cause of the morbid symptoms; indicating therefore the repetition of vomiting. It has been upon occasions of this practice that we have known repeated vomiting, not only to give no durable relief, but rather to increase the supposed cause."

But it is well known, that the effects of emetics go further than the mere evacuation of the stomach; and that the duodenum, with a portion of the jejunum, may be, and commonly are, evacuated at the same time. The peristaltic motion of the alimentary canal may proceed downwards or upwards; and when any portion of it acting, is, by any circumstance, directed in one way, the next adjoining portion follows the same direction. From this, in vomiting, as the peristaltic motion of the stomach is directed upwards, so the motion of the duodenum is directed in the same manner, and pours its contents into the stomach; from which it will appear, that in vomiting, a considerable portion of the upper part of the intestines may be evacuated, as has been stated.

An undeniable proof of the inverted motion of the duodenum is, that in vomiting, and especially after repeated vomiting, a quantity of bile seems to be poured from the duodenum into the stomach, and is in consequence thrown out by the mouth. This frequent appearance may depend entirely upon the quantity of bile present in the duodenum, but it probably extends farther. "When, in consequence of digestion," says Dr. Cullen, "alimentary matters pass into the duodenum, as it may be supposed that nature intends the gall-bladder and biliary ducts should then pour their fluids more copiously into the duodenum; so it may be supposed, on this occasion, that bile is poured more copiously into the duodenum, and, in consequence of the inverted motion, more copiously into the stomach, from whence it may appear more copiously in what is thrown up by vomiting. If this should not be thought sufficient to account for a quantity of bile being frequently thrown up by vomiting, there is another cause, perhaps one more powerful, to be alleged. In the action of vomiting, as the contraction of the diaphragm and of the abdominal muscles concurs at the same time, the whole viscera of the abdomen are strongly pressed: this pressure must affect the gall-bladder and biliary ducts, and occasion them to pour out their contents very largely; and thereby especially a large portion of bile may be thrown up by vomiting."

The Dr. adverts to an opinion prevalent with the vulgar, and even with some physicians, that the bile, thrown up in vomiting, existed previously in the stomach itself. In some instances, he allows, it may have been so; but it is more probable that it has been brought from the duodenum, and even from the gall-bladder and biliary ducts, in the manner which has been explained. If the bile, indeed, had been previously lodged in the stomach

itself, it must have appeared in the first vomitings as well as in the last; but it happens, in almost all instances, that bile is thrown up *only after repeated vomitings*, and often after repeated strainings in the organs employed in that action.

The next effect of vomiting marked by Dr. Cullen, is this evacuation of bile, which, in its consequences, is of the utmost importance in many diseases. That the stagnations ready to happen in the system of the vena portarum often lay the foundation of the most obstinate diseases, is well known; and therefore, the obviating these by frequent vomiting is likely to be of much importance to the health of the system: and indeed, we know of no means of *expediting the circulation in the liver* so powerful as that of exhibiting emetics. The compression also, which the liver undergoes in the act of vomiting, must at the same time be given to the whole viscera of the abdomen: by this the blood's motion in their vessels is accelerated, and the whole of the secretions and excretions in every part of them promoted; and hereby diseases may be both prevented and cured.

"These effects, however, in the *abdominal* viscera," Dr. Cullen allows, "are not often remarkable; but the effects of the same motions in the *viscera of the thorax* are often evident and considerable. The simultaneous contractions of the diaphragm and abdominal muscles, and the alternate relaxations of the organs of respiration, must variously agitate the motion of the air in the bronchia, and thereby expectoration be most effectually promoted. Both by this, and the agitation of the blood-vessels, it will be obvious, that vomiting may be often useful, as we commonly find it to be, in all catarrhal affections. That it may be also useful in many cases of phthisis pulmonalis we readily allow; but that frequent vomiting may cure this disease, we cannot, either from theory or practice, find any reason to believe."

With regard to the general action of emetics, as they excite the force of circulation in every part of the system, though this may be of much use in particular cases, such an effect is not durable, and it commonly becomes languid in proportion to its former increase. On these accounts it may be justly doubted if this general stimulus can be commonly of much service; yet as directed to, and operating upon particular parts, it may become of great use. Thus, there is a remarkable consent between the stomach and the vessels on the surface of the body; so that the several states of these are mutually communicated to one another; whence the action of vomiting excites particularly the action of the vessels on the surface of the body, and may thereby be of use in restoring the tone, and overcoming the spasm of the extreme vessels which takes place in fevers. See Fever.

As the effects, however, of full vomiting cannot be durable, nor can this operation be conveniently repeated, so this remedy cannot always be employed to prevent the recurrence of feverish paroxysms. But as emetics, though employed in doses not sufficient to excite vomiting, may still produce a degree of action in the stomach, and be communicated to the extreme vessels, so as in some measure to restore their tone, and overcome the spasm affecting them, they may thus be useful in fevers; and as their operation may be rendered more durable than full vomitings, these nauseating doses may be still more useful. Upon this is founded the modern practice of employing emetic remedies in the cure of fevers; and these when administered in small and repeated doses, so as not to occasion vomiting, have been properly named, by Dr. Geo. Fordyce, *relaxants*.

As emetics possess the power of determining to the surface of the body, they are of considerable use in asthma. This practice was first recommended by Dr. Akenside; yet Dr. Cullen says, in many cases of spasmodic asthma, he continued the use of emetics for a long time, without finding that he either prevented the recurrence of the fits, or rendered them more moderate. In other cases, however, he certainly found emetics of use in both these respects; which however happened especially when the asthma was in any degree of the *pituitous* or *catarrhal* kind, and therefore vomiting proved of more service in the winter, than in the summer asthma.

The employment of emetics in hæmorrhagy, Dr. Cullen says, presents a difficult problem. Dr. Brian Robinson, of Dublin, employed frequent vomiting in *hæmoptysis*, and has asserted its good effects in several casses. In several, Dr. Cullen found it might be employed with safety and advantage; but, in one case, the vomiting increased the hæmorrhagy to a dangerous degree. He conceives, however, that this remedy really had been useful as employed by Dr. Robinson, by taking off the determination of the blood to the lungs; but this was not the theory of its proposer: he seems to have been of opinion, that during the sickness that introduces vomiting, there is a constriction formed upon the extreme vessels every where; and that, by this constriction, the hæmoptysis is suppressed. It has been found, indeed, both by Dr. Cullen and others, that *nauseating doses of emetics* have been of service in several instances of uterine hæmorrhage; and materia medica writers have alleged, that small doses of emetics have also produced the same effects in other cases of hæmorrhage; circumstances which seem to be in favour of Dr. Robinson's explanation.

Vomiting may be excited by a variety of means; some of which need no mention, as they cannot be employed in practice. The first, and that most generally employed, is filling the stomach suddenly with a large quantity of a warm insipid liquid. Of

this, almost any kind, given in large quantity, will have the effect: but that the vomiting depends not on the quality but on the quantity of liquid, appears clearly from hence, that warm water of the most pure and simple kind is generally sufficient for the purpose.

As the theory of this frequent operation has not been well explained, Dr. Cullen attempts to do it in the following way. He observes, that, "when meats or drinks are taken into the stomach, it is necessary they should all be retained there for some time, till they have undergone certain changes, by operations to be made upon them in the stomach; and therefore, that they may not pass off too soon by the lower orifice, nature has provided, that on every distension of the stomach, the pylorus should be raised up by the longitudinal fibres, which, in the small curvature of the stomach, pass between its two orifices, and at the same time be contracted by the muscular fibres placed in the duplicate of the coats of the stomach, formed near to the pylorus. This constriction, in ordinary cases, is moderate; but we know it can be so strong as to shut up that orifice entirely: and it is probable that this, as seems necessary, should always happen in vomiting. It is also probable that this contributes to occasion the vomiting, as this constriction of the pylorus must invert the peristaltic motion of the stomach, directing it entirely upwards, and even to a vomiting. If it can therefore be supposed, as I think it may, that the sudden distension of the stomach, by a large draught of warm water, can induce a strong contraction of the pylorus, we shall readily understand how it produces vomiting, or at least contributes to promote it."

But though vomiting may be produced by warm water alone; it is done more readily still, when, at the same time, an emetic medicine is applied to the stomach. The principal emetics in use, are ipecacuanha (see Ipecacuanha), and the preparations of antimony (see Antimony). In many cases, when it may not be proper to give the emetic in such a dose as of itself to excite vomiting, by the assistance of plenty of warm water, small doses of emetics may evacuate the stomach, and even obtain other effects, in the cure of diseases, which are usually expected from this operation. This shows sufficiently the effect of warm water employed on these occasions; and it is particularly an illustration of the same doctrine, that several substances of little power in stimulating the stomach, are, nevertheless, by the assistance mentioned, employed to excite vomiting, such as the infusion of bitter herbs, as of chamomile or carduus benedictus. On the same footing it is, that certain substances which stimulate the stomach more powerfully, but which, on account of their irritating nature, cannot be safely given in such quantity as by themselves to excite vomiting, may, by the assistance of warm water, and by that only, be employed as very safe and useful emetics. Such are an infusion of the root of horse-radish, or a tea-spoonful of mustard as prepared for the table: these are emetics that can hardly be rendered effectual, or be employed, but by the assistance of warm water: with it, however, they afford a gentle and useful means of exciting vomiting.

The substances which, of themselves, when introduced into the stomach, excite this action, are, besides ipecacuanha and antimonials, the following: *Asarum*, *Erigerum*, *Scilla*, and the vitriolated metals. See Asarum, &c.

EMINE'NTIÆ QUADRIGE'MINÆ. See *Tubercula quadrigemina.*

EMISSION, (from *emitto*, to send forth), a term used chiefly to denote the ejaculation of the semen in the act of coition. See Coition and Generation.

EMMENAGO'GA, (εμμηναγωγα; from εμμηνια, *the menses*, and αγω, *to move)*, or menagoga, *emmenagogues;* those medicines that possess a power of promoting the monthly discharge by the uterus in women. Writers on the materia medica, both ancient and modern, but particularly the former, mention many medicines of this class, which, however, Dr. Cullen characterises as "medicines the most unfaithful: and very frequently disappointing our expectations." "I have not," says he, "amongst the most experienced, found any one who does not acknowledge his failures in employing the emmenagogue medicines recommended by writers; nor who does not own, that he cannot, almost in any case of *amenorrhœa*, with much confidence, promise success in curing it." The cause of this failure, is not easy to assign; but Dr. Cullen judges it to be owing to this, "that we have not yet found out a medicine which has any specific power in stimulating the vessels of the uterus."

He supposes, that in consequence of the gradual evolution of the system, at a certain period of life, the vessels of the uterus are dilated; and that, by this congestion, these vessels are stimulated to a stronger action, by which their extremities are forced to pour out their contents. According to this idea, he supposes the menstrual discharge to be upon the footing of an active hæmorrhagy; which, by the laws of the economy, is disposed to return after a certain interval, and which, after some repetition, may, by the power of habit, be determined to return at regular periods. This, he thinks applicable to all the various phenomena and accidental occurrences which happen with respect to this discharge. The use he makes of this reasoning is, to show, that, as in all active hæmorrhagies, the flowing of blood depends especially upon the increased action of the vessels of the part, so, in the uterine discharge, it depends upon an increased action in the vessels of the uterus.

To apply this more particularly, he observes,

"that the interruption of this discharge is in two different states; one of which is, when the menses do not flow about the time of life that is the most usual with the sex; and the other is, when the flow has been established at its usual periods for some time, it is by certain causes interrupted from returning at its usual times. These two states are well known under the titles of the *retention* and the *suppresion* of the menstrual discharge. The first state, that of retention, we suppose to depend upon some weakness of action in the vessels of the uterus; the other, of suppression, we suppose to depend upon some constriction in the extremities of the same vessels, which prevents their yielding to the usual impetus of the blood flowing in the larger portions of them." Dr. Cullen's remarks on the *emmenagoga*, in fact, amount to this, "that the medicines which are to be employed in both the states of amenorrhœa, are chiefly those which strengthen and increase the action of the uterus".

The particular emmenagogues that he enumerates, are aloes, the fetid gums and plants, saffron, castor, iron, and mercury. Of the first, he says the emmenagogue effects are chiefly owing to its operation on the rectum, and this stimulus being conveyed by sympathy, to the uterus. The fetid remedies he doubts the efficacy of, but thinks they deserve to be more fully tried. Saffron he thinks an insignificant remedy. To castor, which is usually administered with the fetid gums, he attributes the beneficial effects that some have fixed upon the latter.

Of iron he says—"in the cases of retention, attended, as they commonly are, with a general flaccidity of the system, the tonic powers of iron are likely to be the most powerful remedy; but at the same time, it will be probable that, in the cases of suppression depending upon a constriction of the extremities of the vessels of the uterus, the same tonic powers may not be so properly employed."

Mercury, as an universal stimulant, and as very commonly reaching the extreme vessels, he says, may be capable of stimulating those of the uterus, and therefore of proving an emmenagogue. "From several trials," says he, "I am persuaded that the continued use of mercury has proved a cure of suppressions. How far it may be employed in cases of retention I am uncertain; but am of opinion, that it can be neither so safely nor so effectually employed in these as in the cases of suppression."

To the catalogue of emmenagogues some add savine, cantharides, and antimonials, but particularly the former. See SABINA.

EMOLLIE'NTIA, (from *emollio*, to soften); EMOLLIENTS. These are medicines which diminish the force of cohesion in the particles of the solid matter of the human body, and thereby render them more lax and flexible. Their action, Dr. Cullen says, is most evident upon the simple solid; and they may possibly also act upon the solid matter of the moving fibres: but except it may be by the heat that is frequently joined with them, they do not seem, by their chemical qualities, to act upon the nervous power. The substances which act upon this, in diminishing the contractility or tone of the moving fibres, are called *sedatives*. See SEDATIVA.

The emollients, properly such, seem to act upon the parts to which they are immediately applied, in two ways: 1. By being insinuated into the substance of the solid; thereby diminishing the density of the whole mass, they diminish its force of cohesion. 2. When, by pervading the small interstices of dry particles, they diminish the friction that might otherwise occur, and thereby render the whole more flexible. The former seems to be the operation of water, the latter that of oil and unctuous substances.

"The operation of emollients," says Dr. Cullen, "is most considerable in the parts to which they are immediately applied; but as the whole of the solid matter of the body is constantly in a preternaturally extended state, and as, at the same time, the several parts are so connected as to form one continuous body; so the tension of the whole must in some measure depend upon the tension of every particular part. It is therefore that the relaxation of any one part must in some measure affect the whole. It is, indeed, in this way, that the effect of emollients is often extended much beyond the part to which they are immediately applied.

"As, however, the effect of emollients is still most considerable in the part to which they are immediately applied, it will be evident that their effect will be most considerable upon the surface of the body; and it is a question how far they can be rendered so in the internal parts. Upon this subject it may be readily imagined, that as they may be applied to the internal surface of the alimentary canal, their effect there may be exceedingly great: yet although I would not maintain that this must be none at all, yet I am disposed to think, that except in the mouth and fauces, or in the large intestines to which they can be copiously and immediately applied, they cannot in the other parts of the alimentary canal be very considerable. The internal surface of the stomach and intestines is very constantly covered with a considerable quantity of mucus, not readily diffusible in water, and therefore likely to prevent the insinuation of water or oil into their coats."

Being unassisted by any additional heat, which is often required in their action upon the external parts, their efficacy must be less on that account: and another circumstance which may prevent their action upon the alimentary canal is, that their application to any particular part can never be very durable; as water, the chief form of emollients, must pass on very quickly, or be taken up by ab-

sorption. Dr. Cullen says he has known two pounds of water absorbed from the rectum in the space of an hour.

With respect to the blood-vessels, the effect of this class of remedies is still more doubtful. Here even a large quantity is slowly introduced, is soon very much divided, can never be applied in large quantity to any one part, and must always be mixed with a quantity of fluid that is not very penetrating. At the same time, it is applied to a surface constantly covered with an exsudation not readily miscible with water; and with all this, it is constantly in a rapid progressive motion, by which it must soon escape out of the body. Hence it would appear, that emollients, as watery, can hardly ever have any action in the vascular system: and therefore, in explaining their effects on the solids, we are almost limited to the consideration of them merely as they act upon the external surface of the body, or on the parts immediately subjacent.

Dr. Cullen here asks, "whether water of a lower temperature than that of the body itself can act as an emollient?" He thinks not: but water of a temperature any thing above 62°, constantly applied, soon ceases to give the sensation of cold which it gave on its first application; and after a short time it gives a sensation of warmth. Water, therefore, of any temperature above 62, that is continued to be applied till it gives a sensation of warmth, may act as an emollient. The greater the warmth, however, if within the bounds the skin will bear without pain, the greater its emollient power will be; both because the heat will render it more penetrating, and because the heat, within the bounds mentioned, tends also to soften and relax the simple solids.

But water penetrates the skin more powerfully in the state of vapour than in its liquid form; and it is found that the human body will bear a greater degree of the heat of water, in a state of vapour, than in its liquid form. Hence it is, that cloths wrung out of boiling water, if so wrung as to give only a vapour, may be more safely applied, and with more advantage, as emollients, than liquid water. The application of heat, however, must always be limited, so that its stimulus be no ways inconsistent with the purpose intended.

Whether emollients be applied in vapour or in a liquid form, to give them effect, it is necessary that their application be continued for some length of time; and therefore benefit is often obtained by the emollients being applied in the form of poultice; by which both the moisture and heat become in some degree constant.

The manner of applying warm water as an emollient, by making it fall in drops from some height upon the part affected, called by the French a *douche*, remains to be mentioned. Whether in this manner the water penetrates more readily or fully into the substance of the part, Dr. Cullen will not positively determine; but he rather inclines to an opinion "that the *douche* acts only by a mechanical power, exciting an oscillation in the vessels of the part, which, analogous to friction, may sometimes resolve obstructions, or excite sense and motion in paralytic parts." He confesses he cannot otherwise explain the effects of *pumping water upon any part.*

As the cuticle is often in a dry and constricted state, the application of emollients will soften and relax this, and thereby, in some measure, take off the tension of the subjacent parts. But, in many cases, the operation goes no further. The action of oil seems to be similar. The cuticle, composed of numberless dry squamæ, between which oil may be insinuated, the whole may be rendered more lax and flexible by it.

As warm water, or vapour, penetrates the skin itself, so it may be supposed also to relax the coats of the numerous blood-vessels laid in its texture. By this, the tension of the subjacent parts, particularly of the muscles, must be considerably diminished; and in proportion to the extent of that, there occurs a relaxation of the whole system. These effects are more particularly observed in parts under a state of inflammation: as, in that case, the vessels are distended, and thereby irritated; so their relaxation, by favouring the more free transmission of the fluids, may diminish the irritation, and produce a healthy tendency.

As the action of the heart and arteries is often increased and supported by a spasmodic constriction of the extremities of the vessels on the surface of the body; so the relaxation of that constriction, by emollients applied, may occasionally take off the irritation of the heart and arteries. By relaxing external parts, they may also take off spasms of internal parts particularly connected with these. Thus fomentation, by relaxing the teguments of the abdomen, often relieves the spasms of the intestines which take place in cholic and dysentery. Applied to any one part, both by relaxation and stimulus, emollients must determine the fluids more copiously into that part, and diminish their influx into others. Hence, by relaxing the extremities of the vessels on the surface of the body, they favour perspiration and sweat, and at the same time take off any determination to the internal parts. Thus also *pediluvia*, when they do not prove stimulant to the system, diminish the determination of blood into the vessels of the head.

After observing that the effect of external emollients is greatly promoted by friction (see Friction), Dr. Cullen farther observes, that, as the warmth and humidity applied to the surface of the body, act upon innumerable nerves that terminate in the skin, and constitute there a peculiar organ of sense; so, it is probable, that this sort of application has considerable effect upon the nervous

system, both by relaxing and stimulating, and may in this way contribute greatly to many of the effects usually attributed to this class of remedies.

Of *particular emollients*, the first that deserves to be mentioned is simple water, more or less warmed. Whether any advantage can be gained by any additions to this, Dr. Cullen professes himself doubtful. It is possible, that if oil can be blended intimately with water, this might perhaps carry the oil so blended with it into the interstices of the solid parts, and thus more effectually induce relaxation. As milk contains an oil already intimately blended with the water, so it may possibly, as common practice supposes, be an effectual emollient. This, however, is presumed from theory; for Dr. Cullen was not able to perceive the emollient power of milk to be greater than that of simple water. To improve the emollient virtue of water, surgeons usually employ the decoctions of several plants of the mucilaginous kind; not any of the others being of the least advantage. The oleraceous and other plants, as the *Melilotus*, *Parietaria*, &c. &c. are now laid aside very properly; those only being now chosen that afford a mucilage. Of this kind are the roots and leaves of the *Columniferæ*, especially *althœa* and *malva*, which give out more or less of this matter. The only advantage that can be derived, even from them, seems to be, that as warm water washes off the unctuous matter that commonly defends the cuticle, water impregnated with mucilaginous matter, may leave some portion of the mucilaginous matter behind, and thereby obviate the dryness of the cuticle which might otherwise occur.

With this view also, a great variety of farinaceous seeds have been employed; those especially which have much oil blended with their farina, as the lintseed. Dr. Cullen, however, is persuaded, that the more oily is the nature of the farinacea, still more will this diminish the emollient virtue of water. In another respect, indeed, these have some advantage. We have said that emollients have more durable effects, when applied in the form of a poultice; hence, as the farinacea are commonly employed for this latter purpose, the more oily kinds, as being less liable to dry, will always be the best.

Another form of emollients is the oily. The mild oils of vegetables, and fat of animals, have been promiscuously employed for this purpose. They chiefly act, as has been said, by producing a greater flexibility in dry parts. In this way they operate especially upon the cuticle; and, in some measure, take off the tension of the subjacent parts. But that these oily matters ever penetrate into the substance of the skin, cannot be perceived; and when they are seemingly taken in from the surface, it is by absorbing vessels, and that certainly never in any considerable quantity.

It has been commonly supposed, that the application of oil to the skin might stop up its pores, and hinder perspiration; but, from several considerations, it appears that there is no just foundation for this: and the very general practice of the ancients, as well as of the Asiatics in modern times, is a certain proof of the contrary.

EMPHYSE'MA, (εμφυσημα; from εμφυσαω, *to inflate)*. Air in the cellular membrane. See Pneumatosis.

EMPI'RICS, (εμπειρικος, from εν, *in*, and πειρα, *experience)*, a sect of physicians, founded, after the days of Herophilus and Erasistratus, by Serapion of Alexandria, about 287 years before Christ. The division into dogmatists and empirics had indeed subsisted before: but about this time the latter party began to grow strong, and to have champions publicly asserting its cause. Galen informs us, that Serapion used Hippocrates very ill in his writings; in which he discovered an excess of pride, self-sufficiency, and contempt for all the physicians that went before him. We have some sketches of his practice in Cœlius Aurelianus, from which we may infer, that he retained the medicines of Hippocrates and the other physicians who went before him, though he rejected their reasoning. We know not what arguments he advanced for the support of his sentiments, since his works are lost, as well as those of the other empirics; and we should know nothing at all of any of them, if their adversaries had not quoted them in order to confute them.

The empirics admitted only one general method of obtaining skill in the medical art, which was by experience, called by the Greeks εμπειρια. From this word they took their name, and refused to be called after the founder or any champion of their sect. They defined experience a knowledge derived from the evidence of sense. It was either fortuitous, or acquired by design. For acquiring practical skill they recommended what they called τηρησις, or one's own observation, and the reading of histories, or cases, faithfully related by others. Hence they thought that we are enabled to know a disease by its resemblance to others; and, when new diseases occurred, to conclude what was proper to be done, from the symptoms they had in common with others that were before known. They asserted, that observation ought principally to be employed in two different ways: first, in discovering what things are salutary, and what are of an indifferent nature; and, secondly, what particular disease is produced by a certain concurrence of symptoms; for they did not call every symptom a disease, but only such a combination of them, as, from long experience, they found to accompany each other, and produced such disorders as began and terminated in the same manner.

On the other hand, the dogmatist affirmed, that there was a necessity for knowing the latent as well as the evident causes of diseases, and that all physicians ought to understand the natural actions and functions of the human body; which necessarily presupposes a knowledge of the internal parts. By secret or latent causes, they meant such as related to the elements, or principles, of which our bodies are composed, and which are the origin of a good or bad state of health. They asserted that it was impossible to know how to cure a disease without knowing the cause whence it proceeded; because, undoubtedly, it behoved these to vary prodigiously, according to the different causes by which they were produced.

The term empiric, in a popular sense, is now applied, in a very opposite way, to those *quacks* who deviate from the line of conduct pursued by scientific and regular practitioners, and vend nostrums, or sound their own praise in the public papers.

EMPLA'STRUM, (of εμπλασσω, *to spread upon)*, a composition for external use, generally spread upon leather, linen, or other convenient thing, before it is applied. Plasters, like liniments, cerates, &c. are all combinations of fixed oil, or animal fat, with other substances, and differ from the latter only in consistence. *Plasters* are the most solid of these compositions, and when cold, should be firm, and not disposed to adhere to the fingers; but when gently heated, should become sufficiently soft to spread easily, and should then adhere closely to the skin. Plasters derive their firmness, either from a large proportion of wax, resin, &c. or from the presence of some metallic oxid, such as that of lead, which enters intimately into their combination. They should also have such a consistence, that the heat of the body should render them tenacious enough to adhere to the skin, and to the substance on which it is spread. When prepared, they are usually formed into rolls, and inclosed in paper. Plasters of a small size are often spread on leather, sometimes on strong paper, by means of a spatula gently heated, or merely with the thumb. The leather is cut of the shape wanted, but somewhat larger; and the margin all round, about ¼ inch in breadth, is left uncovered, for its more easy removal when necessary. Linen is also often used, especially for the less active plasters, which are used as dressings, and often renewed. It is generally cut into long slips of various breadths, from one to six inches. These may either be dipt into the melted plaster, and passed through two pieces of straight and smooth wood, held firmly together, so as to remove any excess of plaster; or, what is more elegant, they are spread on one side only, by stretching the linen, and applying the plaster, which has been melted and allowed to become pretty cool, evenly, by means of a spatula gently heated, or, more accurately, by passing the linen on which the plaster has been laid, through a machine formed of a spatula fixed, by screws, at a proper distance from a plate of polished steel. It is by this last means that plaster is spread, in large quantities, for hospitals, &c.

The Edinburgh college give the following general directions for the preparation of plasters, the mode of doing which is the same in other pharmacopœias, or the variation not worth repeating.

> "In making these compositions, the fatty and resinous substances are to be melted with a gentle heat, and then constantly stirred, adding, at the same time, the dry ingredients, if there be any, until the mixture, on cooling, becomes stiff."

The substances which enter into these compositions are exceedingly various. The leading ingredient will direct to the head under which each will be found in detail. For those in most frequent use, see Adhesive Plaster.

The following is an instance of a plaster, in general request, not formed of unctuous ingredients.

> Dissolve five ounces of isinglass in a pint of water; and having ready a quantity of thin black sarsenet, stretched in a proper frame, apply the warm solution with a brush, equally over the surface. When dry, repeat this a second or a third time.

Some brush it over, finally, with a weak solution of gum benzoin in alcohol, but this is unnecessary, if not prejudicial; as, in the first place, it renders it more difficult to moisten, previous to its application; and secondly, the irritating quality of the resin may dispose a fresh wound to fester. This has been long known under the name of *Ladies' Court Plaster.*

EMPROSTHO'TONOS, (εμπροσθοτονος; from εμπροσθεν, *before*, or *forwards*; and τεινω, *to draw);* a clonic spasm of several muscles, acting so as to keep the body in a fixed position and bent forward. Celsus calls it a convulsive stiffness of the neck, by which the chin is fixed to the breast. Cullen considers it as a species of tetanus. See Tetanus.

EMPYE'MA, (from εν, *within*, and πυον, *pus)*, a name by which the ancients called all internal suppurations; but at present it is confined to a collection of *purulent matter lying loose in the cavity of the chest*, and lodging on the diaphragm. Dr. Cullen considers it as a termination of pneumonia, and says, its symptoms are, a remission of pain, after a pleurisy has terminated in suppuration, often after a vomica: whilst difficulty of breathing, cough, uneasiness in lying down, and hectic fever, continue, frequently attended with a sensation of some fluid fluctuating in the breast, and signs of hydro-thorax.

The pus, that forms an empyema, may be from an abscess in the lungs, pleura, mediastinum, pericardium, or diaphragm; or perhaps from that inflammatory exudation, or inspissated serum, which, Dr. Hunter observes, is formed into a kind of pus, and is often found in large quantities in the cavities of the breast, belly, &c. Wounds in the breast may also evacuate their matter into its cavity, and prove a cause of this disease. And Le Dran informs us, that he met with instances of abscesses in the liver making a way through the diaphragm, and emptying themselves into the breast. Sauvages reckons up six varieties; though these are not always capable of being distinguished.

The same symptoms usually occur whether the fluid matter collected in the cavity of the breast be purulent or otherwise. The kind of matter which is lodged, indeed, can only be known by the nature of the disorder which preceded the accumulation, and from the preceding and concomitant symptoms. The matter may be blood, or serum, as well as pus.

If the matter of an empyema be not speedily expectorated, the patient dies of a consumption, with a hectic fever, which is always exasperated at night. If the matter has found its way through the mediastinum, upon perforating the thorax, a sudden suffocation is apt to ensue. If the empyema be of long standing, the patient's strength reduced, a colliquative diarrhœa coming on, with emaciation, the operation, instead of relieving, hastens the death of the patient. When this disorder is merely local, however, the operation may succeed: but still, if the habit be strumous, or otherwise unsound; if fever, coughing, thirst, and other symptoms, are either numerous or considerable in their degree, there is but little prospect of recovery. The operation is also ineffectual, if the lungs adhere to the pleura, or if the matter lodged on the diaphragm has been emptied from a cyst.

Relief in this disease is obtained by the paracentesis of the thorax (see PARACENTESIS); simply named, when performed in this particular affection, *the operation for the Empyema*. This ought to be performed as soon as there is evidence of the collection being the cause of the oppressed breathing, and that there are no hopes of this being relieved by expectoration. It ought to be done upon the part where the collection is supposed to be situated; and this may be known by the seat of the previous pain, and perhaps by the matter being distinguished between two of the ribs. If no matter flow, it is probably seated in the substance of the lungs; but even in this case, such an opening may be useful, by taking off the support, and giving the abscess an opportunity of bursting. If the undulation of the fluid be general, the operation is to be performed in the following manner: the patient is to be laid in an horizontal posture, with the affected side inclining a little over a table. An incision is then to be made with a scalpel through the skin and cellular substance, between the sixth and seventh ribs, and half-way between the spine and sternum, from one to two inches in length, and in the direction of the ribs. The muscles are then to be cut through, keeping as near as possible to the upper edge of the inferior rib, to avoid wounding the intercostal vessels and nerves. As there is no occasion for the bottom of the wound being of the same length with the external incision, it may be gradually contracted, so as at last to be only about the half. The pleura being now exposed, is to be divided by slight scratches, taking the assistance of a furrowed probe to prevent the lungs from being injured, in case they shall be found adhering to the ribs. If the contrary takes place, the fluid will rush out immediately upon a small opening being made into the cavity of the thorax; but if an adhesion appear, and if it be slight, which may be known by the introduction of a blunt probe, as much of it may probably be separated as to allow the fluid to escape. In case it be considerable, the incision is either to be continued a little nearer to the sternum, or an attempt made in some other part. After the fluid is observed to flow, it will be proper to introduce a silver canula (represented in pl. xvi.) at the opening; by which means it will run more readily off, or can be more easily stopped in case the patient become faint. If the quantity of fluid be not considerable, it may generally be drawn off at once; but if it be great, partial evacuations ought to be made at different intervals, as circumstances may direct.

The canula, therefore, should be so formed, that, by means of a strap put round the body of the patient, it can be readily secured. Its mouth is to be stopped by means of a cork. A pledget of emollient ointment is to be laid over the wound: and the whole being fixed by a napkin and scapulary bandage, the patient should be laid to rest. The remainder may be drawn off, probably in a day or two, or as soon as it is supposed the patient can bear it. After the fluid is carried off, the canula is to be withdrawn and the wound healed: or in case the operator be afraid of bad effects being produced upon the lungs by irritation from the canula, though of this there will be little danger, as the lungs will generally be out of its reach, the skin may be so drawn back before the first incision is made, as afterwards to serve the purpose of a valve. And for some days after the operation, the incision in the integuments may be brought opposite to that in the pleura, to allow the matter to run off, or to produce a radical cure by exciting a certain degree of inflammation over the lungs and inside of the thorax.

After the matter is evacuated, the wound ought to be kept open a considerable time, for the pur-

pose of discharging the matter as fast as it is collected. If the wound be apt to heal up too soon, which will be known by the symptoms of oppression being renewed, it will be proper to keep the passage open by tents, or to introduce a bougie or silver canula a few hours occasionally, till the source of the matter be dried up; which, however, seldom happens for a considerable time, and frequently never. By attending to this circumstance, the patient may enjoy good health; whereas, by the neglect of it, a repetition of the first operation would soon be necessary.

This operation is sometimes resorted to for the discharge of other fluids besides pus. For the discharge of blood, however, it is not always required; as that, in many instances, has been gradually absorbed. According to Mr. Sharp, Mr. Pott, and other eminent writers, it need not, therefore, be removed by an artificial opening. Mr. Gooch relates a case, in his Medical Observations, of air in the thorax producing the symptoms of an empyema. It passed through an ulcer in the lungs; but the ulcer healing, the air was evacuated by the operation for the empyema, and a complete cure was effected. Whether the opening be made by means of a knife or a trochar, as Albinus has observed that the diaphragm on the right side ascends higher into the thorax than on the left, it may be proper to pierce it on the right side *between the third and fourth false ribs;* but on the left, *between the second and third;* and *at about half or two-thirds of the distance from the sternum to the vertebræ;* for here the muscles are thinnest, the artery is concealed under the rib, and the diaphragm is at a safe distance. Matter lodged in both cavities of the thorax, requires that the operation be performed on each side.

EMPYE'MATA, (*εμπεματα*, from *εν*, and *πυον*, *pus)*, a name given by the ancients to those remedies called *suppuratives*.

EMPYREU'MA, (*εμπυρευμα*; from *εμπυρευω*, *to kindle*, and *πυρ*, *fire)*; the offensive smell that oils and other substances receive from being exposed too much to fire. Hence we apply the term *empyreumatic*, to any thing smelling as it were burnt. Empyreumatic oils agree, in many particulars, with the volatile oils obtained from vegetables, but they also differ from them in the following important circumstances. The latter exist ready formed in the aromatic substances, from which they are obtained, and are only separated from the fixed principles by the action of a heat not exceeding that of boiling water. The former, on the contrary, are always formed by the action of a degree of heat considerably higher than that of boiling water, and are the product of decomposition, and a new arrangement of the elementary principles of substances, containing at least oxygen, hydrogen, and carbon. Their production is therefore always attended with the formation of other new products. In their chemical properties they do not differ very remarkably from the volatile oils, and are principally distinguished from them by their unpleasant pungent empyreumatic smell and rough bitterish taste. They are also more apt to spoil by the contact of the air, and the oftener they are re-distilled they become more limpid, less coloured, and more soluble in alcohol; whereas the essential oils, by repeated distillations, become thicker and less soluble in alcohol. See Animal Oil. It is well known that their action on the body is exceedingly stimulant and heating.

EMULGENT VESSELS, (from *emulgeo*, to milk out: applied to the veins and arteries which go from the aorta and vena cava to the kidneys, because the ancients supposed they strained out the serum through the kidneys), the vessels of the kidneys; also termed *renal* vessels. The emulgent artery is a branch of the aorta: the emulgent vein evacuates its blood into the ascending cava. See Kidneys.

EMULSION, a soft and somewhat oily medicine, resembling milk. Emulsions have been usually prepared by grinding the oily seeds of plants, or kernels of fruits, along with common water, or any agreeable simple distilled water. In this process, the oil of the subject is, by the mediation of the other matter, united with the aqueous fluid; and hence they possess some share of the emollient virtue of the pure oil; with this advantage, that they are agreeable to the palate, and not apt to turn rancid or acrimonious by the heat of the body, which the pure oils in some inflammatory cases may do.

Emulsions, besides their use as medicines themselves, are excellent vehicles for certain substances which cannot otherwise be so conveniently taken in a liquid form. Thus camphor, triturated with almonds, readily unites with water into an emulsion; and in this form is conveyed into the remotest parts of the body, with sufficient efficacy to answer intentions of moment, at the same time that its heat and pungency are softened by the unctuosity of the almonds.

Bland oils, balsams, resins, and other similar substances, are likewise rendered miscible with water, into emulsions or milky liquors, by the intervention of mucilages. The white or yolk of an egg unites these bodies also with water, but less elegantly.

Several of the gummy-resins, as *ammoniacum*, *galbanum*, *myrrh*, and others, are reducible into emulsions by trituration with water alone; their resinous part being rendered dissoluble by the mediation of the gummy.

Emulsions are commonly prescribed with a view to correct acrimony in the fluids. Prepared with almonds, gum arabic, &c. (see Amygdalæ) they

are given in strangury, dysuria, &c. See those articles.

EMUNCTORIES, (from *emungo*, to drain off). The excretory ducts of the body are so termed: thus the exhaling arteries of the skin constitute the great emunctories of the body: the glands are also thus termed.

ENÆORE'MA, (εναιωρημα, from εν and αιωρεω, in sublime attollor, *to be lift up)*; called also *Nubeculæ*, *little clouds;* those contents of the urine which float in the middle, resembling a cloud.

ENA'MEL. See TEETH.

ENARTHRO'SIS, (εναρθρωσις; from εν, *in*, and αρθρον, *a joint)*; the ball and socket joint. A species of diarthrosis, or moveable connexion, in which the round head of one bone is received into the deep cavity of another, so as to admit of motion in every direction; as the head of the os femoris with the acetabulum of the os innominatum, the humerus and scapula, &c. See ARTICULATION.

ENCA'NTHIS (from εν, *in*, and κανθος, *an angle of the eye)*; an encysted tumor on its inner angle. At first a tubercle appears on the caruncula lachrymalis, or, on the crescent-like red cuticle, adjacent to it; afterwards this tumor extends over the pupil of the eye: when this happens, the tears continually trickle down the cheeks, the sight is impaired, the countenance deformed, and the eyes inflamed.

ENCATHIS'MA, (εγκαθισμα, from εγκαθεζομαι, *to sit in)*; a semicupium.

ENCAU'MA, (εγκαυμα; from εν, *in*, and καιω, *to burn)*, or ENCAUSIS; a pustule produced from a burn. The latter term denotes also the *heart-burn*, with thirst; in Cullen's Nosology, sinonymous with *erythema* and *ambustio.*

ENCE'PHALI, a species of worms said to be bred in the head, and causing pain and delirium. Those worms which have been expelled from the nose, ears, and teeth, have also been named *encephali.*

ENCE'PHALON (εγκεφαλον; from εν, *in*, and κεφαλη, *the head)*, or ENCEPHALUM. By some writers the cerebrum only is so called; and others express by this term the contents of the cranium, membranes included.

ENCHY'MATA, (εγχυματα); liquid medicines to be infused into the eyes, ears, &c. as the tinct. opii in ophthalmia.

ENCHYMO'MA (εγχυμωμα, of εγχυμος, from εγχυω), in the writings of the ancient physicians, a word by which they express that sudden effusion of blood into the cutaneous vessels of the face, which arises from joy, anger, or shame; and in the last instance is what we usually call blushing.

ENCŒ'LIA, (εγκοιλια, from εν, *in*, and κοιλια, *the belly)*; all the contents of the abdomen.

E'NCOPE, (εγκοπη, from εν, *in*, and κοπτω, *to cut)*; an incision, and figuratively, an impediment.

ENCY'STED, a term applied to those tumors which consist of a fluid, or other matter, enclosed in a sac or cyst. See CYST. Some writers call a wen *encysted*, but this may or may not be the fact.

ENDE'MIC, *(endemicus*, ενδημικος; from εν, *in*, and δημος, *people)*. A disease is so termed that is peculiar to a certain class of persons, or to a particular country: thus struma is endemial to the inhabitants of Derbyshire and the Alps; scurvy to seafaring people; intermittents to the inhabitants of fenny countries; and the plica polonica is only to be met with in Poland. See EPIDEMIC.

ENDE'MIAL CAUSUS. See CAUSUS.

ENDI'VIA, *(quasi eundo viâ, quia passim nascitur;* named from the quickness of its growth), or *Endiva;* ENDIVE. This plant, the *Cichorium endivia; floribus solitariis, pedunculatis; foliis integris, crenatis*, Linn. is an extremely wholesome sallad, possessing bitter and anodyne qualities.

ENDI'VE. See ENDIVIA.

ENE'MA, (ενεμα, *a clyster*, from ενιεμι, *to inject*, or *throw in)*. The words *enema*, *clyster*, and *lavement* (Fr.), are equivalent to each other, and signify any liquid medicine injected into the anus. The following formulæ are in general use:

Enema de amylo.

Take of the jelly of starch, four ounces;
Olive oil, half an ounce.
Liquefy the jelly over a gentle fire, and then mix in the oil. Forty or fifty drops of tinct. opii are sometimes added.

Enema opiatum.

Take of Infusion of linseed, six ounces;
Tincture of opium, forty to one hundred drops.

Or,

Take of Mutton broth, five ounces;
Opium purified, three to five grains.
Dissolve the opium in the warm broth, and inject.

Enema astringens.

Take of Lime-water, ten ounces;
Tincture of catechu, half an ounce.
Mix them together for a clyster, of which one half is to be injected at a time.

Enema commune.

Take of Decoction of chamomile flowers, twelve ounces;
Lenitive electuary, one ounce;
Common salt, half an ounce;
Olive oil, two ounces.
Mix them together.

Enema domesticum.

Take of Cows' milk, half a pint;
Brown sugar,
Olive oil, of each one ounce.
Mix them together.

Enema emolliens.

Take of Palm oil, an ounce and a half;
Cows' milk, half a pound.
Let the oil be beaten up with the yolk of one egg, and then add the milk, not too hot.

Enema fœtidum.

Take of Asafœtida, one drachm;
Olive oil, half an ounce;
Oil of amber, fifteen drops;
Hot water, nine ounces.
In the water dissolve the asafœtida, and add the oil of amber. The quantity of the composition here directed, is to be injected at a time.

Enema terebinthinatum.

Take of the solution of starch, ten ounces;
Venice turpentine (dissolved in the yolk of an egg), half an ounce;
Linseed oil, one ounce.
Mix them together.

The uses of these compositions are sufficiently obvious from their titles. The *starch*, *anodyne*, *emollient*, and *astringent clysters*, are used in *dysenteries*, and other *alvine fluxes*, to strengthen the tone of the intestines, defend them from being corroded by the acrimonious humours, to heal their exulcerations, and ease the pains which accompany these disorders. The *turpentine clyster* is injected in nephritic, the *fœtid* in hysteric, cases. The others are calculated for unloading the intestines of their contents, where the exhibition of purgatives in other forms is improper, or unsafe. Clysters have been looked upon by some as mere topical applications, whose operation was confined to the intestines into which they are received. But experience has shown, that in many cases their action is extended much further. Thus the turpentine clyster promotes the discharge by the kidneys, and communicates to the urine a violet smell; and the anodyne clyster proves narcotic, as if a moderate dose of opium had been swallowed. Persons have been inebriated by spirituous clysters; and life has even been supported for several days, by those of a nutritious kind.

Clysters of an infusion of the leaves of tobacco, are employed in cases of strangulated hernia. See Hernia, and Nicotiana.

ENERGY, *(energia*, from ενεργεω, *to act)*, powerful and healthy action, or the natural degree of force exercised by the constitution on any subordinate function. Thus we speak of the nervous energy, muscular energy, &c.

ENGASTRIMY'THOS, (εγγαστριμυθος), a ventriloquist, or one who emits sounds, like the voice of one speaking, out of the stomach or belly, without using the organs of speech; such as is reported of the Pythian prophetess.

ENI'XUM, (from *enitor*, to bring forth); a term by the chemists applied to a neutral salt, consisting of an acid and alkali. The *Sal Enixum Paracelsi* was the caput mortuum of spirit of nitre, joined with vitriolic acid; much the same as the vitriolated kali.

ENGLISH MERCURY. See Allgood.

ENNEA'NDRIA, (from εννεα, *nine*, and ανηρ, *a man*, or *husband)*, in botany, the name of the ninth class in Linnæus's sexual system, consisting of plants which have hermaphrodite flowers with nine stamina or male organs. See Botany.

ENSA'TÆ, (from *ensis*, a sword), in botany, the name of the sixth order in Linnæus's natural method, consisting of plants with sword-shaped leaves. It contains the following genera, viz. Antholyza, Callisia, Commelina, Crocus, Eriocaulon, Ferraria, Gladiolus, Iris, Ixia, Moræa, Pontæderia, Sisyrinchium, Tradescantia, Wachendorffa, Xyris.

E'NSIFORM CARTILAGE, (from *ensis*, a sword, and *forma*, resemblance), the sword-like cartilage. See Cartilago ensiformis.

ENTERI'TIS, (εντεριτις; from εντερον, *an intestine)*; inflammation of the intestines. It is a genus of disease in the class *pyrexiæ*, and order *plegmasiæ* of Cullen, who describes two species: 1. *Enteritis Phlegmonodœa*, or the *acute* enteritis. 2. *Enteritis Erysipelatosa*, or *erysipelatous* enteritis.

The first of these shows itself by a fixed pain in the abdomen, attended with fever, vomiting, and costiveness. The pain is often felt in different parts of the abdomen, but more frequently spreads over the whole, and is particularly violent about the navel.

Inflammations of the intestines may arise from the same causes as those of the stomach; though commonly the former will more readily occur from cold applied to the lower extremeties, or to the belly itself. See Gastritis.

Dr. Fordyce says, an *inflammation of the exterior coats* of the intestines (of which the following are the symptoms and manner of treatment) differs greatly from that of the *interior*, *villous*, *or mucous membrane;* this last being attended with *dysentery*, or *aphthæ*.

It is brought on by external cold, fever, indurated *fæces*, heavy or hard bodies lying on the intestines, introsusceptions, adhesive stimulants,

spasmodic contraction of the intestines, *hernias*, and wounds. The symptoms are, a pain in the belly, occupying different parts according to the intestine affected; but fixed to the place in which it arose at first. It is extremely acute, except when the disease arises from a wound, and then it is sometimes hardly sensible; it is generally equable, sometimes however increasing by fits, and sometimes diminishing a little. For the most part the whole belly is affected, at the same time, with spasmodic pains and flatulency. The pulse becomes small, hard, frequent, quick, and often at last irregular and intermittent. Coldness of the extremities, together with a sudden and great prostration of strength, take place. The muscular fibres of the inflamed part contract, so that nothing can pass through; and sometimes the *sphincter ani*, in such a manner that a small pipe can with difficulty be introduced into the *rectum*. Flatulencies in the stomach, sickness, violent retchings, and vomiting, are frequently produced. The tongue is dry, with great thirst, and the urine transparent, and sometimes pale, in small quantity, and discharged with difficulty. The breathing is quick, the patient bending forward and compressing his belly, the abdominal muscles being often spasmodically contracted; and from the irritation the patient is cut off, sometimes with delirium and convulsions.

The inflammation frequently terminates in gangrene and mortification, in which case the pain goes off, and the patient appears to himself, for a little, relieved; but the pulse continues frequent, small, and often irregular, and the extremities cold, and he is cut off. If it be left to itself, this disease kills sometimes in ten or twelve hours, and almost always before the end of the third day; so that there is seldom any suppuration. But if the intestines should suppurate, the pain diminishes, and is converted rather into a sense of distension; irregular cold fits, with the other symptoms of internal suppuration, arise; and the contraction of the muscular fibres of the intestines, the great frequency of the pulse, and other symptoms, go off.

There is a greater chance of a suppuration taking place in the colon than in the *duodenum*, *jejunum*, or *ilium*. In this event, the abscess may break either into the cavity of the *abdomen*, or into the intestinal canal. In the first case it is generally fatal, producing a hectic fever; in the second, the *pus* is evacuated by the *anus*, sometimes at first pure, afterwards mixed with the *fæces*, gradually diminishing if the ulcer heals, and the patient is restored; or a considerable quantity of matter continues to be discharged, a hectic fever is produced, and he sinks.

At the beginning of the disease, after the pain has continued for a few hours, sometimes a great secretion takes place in the intestines; the villous membrane is also affected with inflammation, and it is converted into a dysentery: on the other hand, when in an inflammatory dysentery the secretion is imprudently checked by astringents, this kind of inflammation often arises.

It should be distinguished from the stone in the kidneys or ureters, from inflammation of the kidneys, and other abdominal viscera; from the pleurisy, and other inflammations of the thorax; and particularly from spasmodic pains in the intestines, and obstruction of the passage through them where there is no inflammation.

It is to be cured by the immediate application of *the most powerful means of resolution;* we are therefore to bleed to the quantity of twelve or sixteen ounces, notwithstanding the smallness of the pulse, and seeming weakness: for the pulse becomes fuller, and the prostration of strength goes off when the inflammation is diminished; as, on the other hand, they are increased by stimulants: the bleeding is to be repeated at short intervals till the pulse becomes soft.

Purgatives are contra-indicated by the contraction of the inflamed part; and when they have been given, and have not purged, they have often evidently increased the pain, and other symptoms: but evacuations from the intestines, by means of clysters, are made with advantage, and these may be thrown in every two or three hours, till a stool is procured.

Relaxants have not so frequently been exhibited internally as in other inflammations: nevertheless, when used, they are of great service. Thus ipecacuanha or antimonials may be exhibited, as directed under Dysentery. The circulation is also to be brought to the surface of the body by the warm bath, or fomentations applied to the belly: but great care is to be taken, lest cold, from the air or moisture in coming out of the bath, or changing the fomentations, should do more mischief than the remedy does good: these are also useful when the *anus* is much contracted, so that clysters cannot be given.

Narcotic and sedative fomentations are also useful:

℞ Flor. chamæm. manip. ij.
Foliorum rutæ, vel Matricar. manip. j.
Capit. papav. alb. (sem. dempt.) ℥i.
Rad. altheæ recent. ℥j.
Optime contundantur et coquantur in aquæ fontis q. s. per minut. v. decoctum utatur pro fotu, et herb. cocti pro cataplasmate.

℞ Capit. papav. alb. (semin. dempt.) ℥iv.
Coque ex aq. font. lib. iij. per decem min. dein adde,
Sp. vini rect. ℥viij.
Exprimendo, cola pro usu.

Some degree of inflammation of the skin of the belly has been raised by cupping-glasses with benefit: but blisters have not been commonly employed.

If these means should fail of success, opiates sometimes cure, by taking off the contraction; especially when joined with relaxants.

℞ Aquæ menthæ sativæ, ℥iss.
Syr. papaveris alb. ʒij. ad vj.
Antimon. tartaris. gr. $\frac{1}{3}$ ad ss.
Misce fiat Haustus.

Dr. Saunders, as a mild purgative in this disease, recommends,

℞ Kali tartarisat.
Natr. tartarisat.
Natr. vitriolat.
Sodæ phosphorat. (Ph.Edin.)
Magnes. vitriolatæ, } horum cujus volueris ℥ij.
Aquæ menthæ piperit. ℥vj. Solve.
Capiat cochlearia tria alternis horis donec rite solvatur alvus.

The food, both during the inflammation and after it is cured, should be farinaceous decoctions or moist farinaceous porridge or puddings.

Of the *Enteritis Erysipelatosa*, nothing farther need be said, than what has been observed concerning the gastritis. See GASTRITIS.

ENTEROCE'LE, (εντεροκηλη; from εντερον, *an intestine*, and κηλη, *a tumor)*, or *Hernia intestinalis.* Every hernia may be so called that is caused by the protrusion of an intestine, whether it is in the groin, navel, or elsewhere. See HERNIA.

ENTERO-EPIPLOCE'LE, (of the Gr. εντεροεπιπλοκηλη; from εντερον, *an intestine*, επιπλοον, *the epiploon*, and κηλη, *a tumor)*; a hernia formed by the protrusion of part of an intestine, together with a portion ofthe omentum.

ENTERO-HYDROCE'LE, (εντερο-υδροκηλη; from εντερον, *an intestine*, υδωρ, *water*, and κηλη, *a tumor)*; an intestinal hernia, complicated with hydrocele.

ENTERO'MPHALUS, (εντερομφαλος; from εντερον, *an intestine*, and ομφαλος, *the navel)*; an umbilical rupture produced by the protrusion of a portion of an intestine at the navel.

ENTERORA'PHIA, (εντεροραφη; from εντερον, *an intestine*, and ραφη, *a suture)*; the suture of a gut when wounded. It is generally performed by the glover's stitch, and a portion of the thread is left at each end of the seam, to connect it to the necessarily pre-existing wound of the muscles, &c. of the belly, till the wounded gut adheres to the wound of the belly, and forms an artificial anus.

ENTEROSCHEOCE'LE (from εντερον, *an intestine*, οσχεον, *the scrotum*, and κηλη, *an hernia)*; that kind of hernia in which the intestine descends into the scrotum.

ENTRO'PIUM, (εντροπιον; from εν, and τρεπω, *to turn)*; a disease of the eye, and of its lids, occasioned by the eye-lashes and eye-lid being inverted towards the bulb of the eye, by which friction on the conjunctiva takes place, and consequently inflammation.

E'NULA CAMPA'NA, (a corruption of *henula* or *Helenium*, from *Helene*, the island where it grew), also called *Helenium*; common inula, or ELECAMPANE. It is the *Inula helenium; foliis amplexicaulibus ovatis rugosis subtus tomentosis, calycum squamis ovatis*, Linn. Class, *Syngenesia.* Order, *Polygamia superflua.* This plant, though a native of Britain, is seldom met with in its wild state, but mostly procured by cultivation. The root is the part employed medicinally. This, in its recent state, has a weaker and less grateful smell than when thoroughly dried, and kept for a length of time, by which it is greatly improved, its odour then approaching to that of the Florentine orris. It was formerly in high estimation in dyspepsia, pulmonary affections, and uterine obstructions, but it is now disregarded.

ENULON, (ενουλον, from εν and ουλοι, *the gums)*; the internal flesh of the gums, or that part of them which is within the mouth.

ENURE'SIS, (ενουρησις; from ενουρεω, *to make water)*; an involuntary flow of urine. It is a genus of disease in the class *locales*, and order *apocenoces* of Cullen, containing two species: 1. *Enuresis atonica*, the sphincter of the bladder having lost its tone from previous disease: 2. *Enuresis ab irritatione, vel compressione vesicæ*, from an irritation or compression of the bladder.

This is a complaint which frequently affects children, otherwise healthy, when asleep; and is extremely disagreeable. Often it is merely the effect of laziness, and may be driven off by proper correction; but sometimes it proceeds from an atony or weakness of the sphincter of the bladder. Many ridiculous cures have been prescribed for it, and among the rest, field-mice dried and powdered; tonics are frequently of use; but sometimes the disease proves obstinate, in spite of every thing we use. In the London Medical Observations we find blisters much recommended in this disease, when applied to the region of the os sacrum. A girl of thirteen years of age had been subject to an enuresis for four years. She could retain her water but a very little while in the day-time, but it flowed continually in the night. She had taken Peruvian bark and elixir of vitriol in considerable quantities, also Valerian and the volatile julep, without effect. She was severely threatened, as the physician suspected it might arise from a bad habit; but this producing no effect, a blister was applied to the os sacrum, which in twenty-four hours totally

removed the disease. A man, aged thirty-two, having been seized with an incontinence of urine and palsy of the lower extremities, in consequence of taking a quack medicine, was cured of the incontinence of urine in twenty-four hours, by one blister; and of the palsy itself by another. A woman of fifty having been seized with an enuresis and paralytic affection of the right thigh and leg, in consequence of a strain, was cured of both by a single blister. Several other cases are there mentioned, by which the power of blisters in removing this complaint, seems to exceed that of every other medicine whatever. Blisters perhaps have a double effect; acting by their stimulus on the surface, and by the absorption of cantharides. The latter, exhibited internally, *with great caution*, might be of equal advantage. A case of this kind was cured, by the late Dr. Houlston, of Liverpool, by the internal use of alum. In some cases, the cold bath has also been of use; but the grand difficulty is to get the better of the habit which the bladder itself has acquired.

In the Medical and Physical Journal, we find the following instance of this disease successfully treated by the exhibition of *hepatised ammonia*.

"A young man with whom I am acquainted," says the writer, "had been, from his infancy, troubled with an incontinence of urine, the discharge of which he was not at any time able to suppress, particularly during the night. The copious evacuation of this secretion necessarily caused a constant and considerable degree of debility, but I never noticed any symptoms of hectic. A disease so distressing and unpleasant in itself, naturally induced his friends to seek every possible means of relief, by applying to several physicians of eminence, whose prescriptions and advice, although exactly followed, produced no good effect; on the contrary, the malady continued to increase with his years. I had heard much promised from the introduction of the hepatised ammonia, and was tempted in this instance to essay its virtue. I previously examined the state and appearance of the urine voided, and found it to possess both that peculiar smell and saccharine taste, so commonly distinguished in cases of diabetes. On holding it to the light in a glass vessel, it exhibited the appearance of a blueish-red colour, which rendered it somewhat cloudy and opaque; placed in any other situation it appeared perfectly limpid. He began, according to my directions, with taking three drops of the medicine, night and morning, in a little water; this he gradually increased to twenty or twenty-five drops each dose: I also desired him to use animal, and abstain from vegetable food, and ordered for his common drink some water of an alkaline quality. In this regimen he punctually persisted, till he obtained the intended benefit: from the commencement of this course, he gradually amended, evacuations of his urine became less frequent, and at length not involuntary; by degrees it perceptibly lost its unhealthy taste, smell, and colour, and in short, he is at this time entirely released from his disagreeable disorder, and seems to have acquired his usual strength and vigour."

The enuresis from compression must of course be relieved by removing the pressure. Where irritation exists independent of this, the use of hemlock would probably be advantageous.

ENY'STRON, (ενυστρον, from ενυω, *to perfect)*, the last or fourth ventricle in animals that chew the cud, which completes the digestion. According to Aristotle, it is a second ventricle, or thick part of the stomach of ruminating animals, in which the food is concocted. Gorræus makes it the same with *Abomasum*.

EPHE'LIS, (εφηλις; from επι, and ηλιος, *the sun);* a broad, solitary, or aggregated spot, attacking most commonly the face, back of the hand, or breast, from exposure to the sun in hot climates.

EPHE'MERA *(ephemera*, εφημερα; from επι, *upon*, and ημερα, *a day);* a *synocha* fever, which begins, is perfectly formed, and runs through its course, in the space of twelve hours. See Fever and Synocha.

EPHIDRO'SIS, (εφιδρωσις; from εφιδροω, *to perspire)*, *Epidrosis*, *Sudatio*, or *Mador;* a violent and morbid perspiration. It is a genus of disease in the class *locales*, and order *apocenoses* of Cullen. *Symptomatic ephidroses*, he says, vary according to the nature of the diseases which they accompany, the different nature of the sweat itself, and sometimes the different parts of the body which sweat most. See Perspiration.

EPHI'PPIUM, (εφιππιον, *a saddle*, which it is thought to resemble). See Sella turcica.

EPICA'RPIUM, (from επι, *super*, upon, and καρπος, *carpus*, the wrist); in ancient pharmacy, medicines applied to the wrists. These were of any kind, but for convenience, they were generally in the forms of cataplasm or plaster.

EPICO'LIC REGION, (from επι, upon, and κωλον, *the colon)*, in human anatomy, that part of the abdomen, which lies over the head of the cœcum and sygmoid flexure of the colon.

EPICRA'NIUM, (επικρανιον; from επι, and κρανιον, *the cranium);* the common teguments, aponeurosis, and muscular expansion, which lie upon the cranium.

EPICRA'NIUS. See Occipito-frontalis.

EPICYCLOID, in physics, the line described by one circle rolling upon the periphery of another.

EPIDEMIC, *(epidemicus*, of the Gr. επιδημικος; from επι, *upon*, and δημος, *the people)*. A contagious disease is so termed, that attacks many people at the same season, and in the same place; thus putrid fever, plague, dysentery, &c. are often epidemic. Dr. James Sims observes, in the Me-

moirs of the Medical Society of London, that there are some grand classes of epidemics which prevail every year, and which are produced by the various changes of the seasons. Thus, spring is accompanied by inflammatory diseases; summer by complaints in the stomach and bowels: autumn by catarrhs; and winter by intermittents: these being obviously produced by the state of weather attendant upon them, other epidemics are supposed analogous to them, and obedient to the same rules, which on examination not being the case, all further scrutiny is laid aside, perhaps too hastily. There is another reason why little has been hitherto attempted in this investigation, which is, that we only of late possess any tolerably accurate registers of the weather for any one place, and have as yet scarcely any of the diseases that can be depended upon. There is likewise a very great disagreement between the opinions of authors and the vulgar as to the hurtfulness of different kinds of weather; the former always asserting that dry seasons are most noxious, whilst the latter as constantly blame the wet. Now, although in many points little weight is to be given to the sentiments of the latter, yet in matters within their reach the case is otherwise, and in the present difference neither are totally right nor wrong; the truth seems to be as follows:

The most natural and healthful seasons in this country are a moderately frosty winter, showery spring, dry summer, and rainy autumn; and whilst such prevail, the wet part of them is infested by vastly the greatest proportion of complaints, but those not of the most mortal kind. A long succession of wet seasons is accompanied by a prodigious number of diseases; but these being mild and tedious, the number of deaths are not in proportion to the co-existent ailments: on the other hand, a dry season, in the beginning, is attended with extremely few complaints, the body and mind both seeming invigorated by it; if, however, this kind of weather last very long, towards the close of it a number of dangerous complaints spring up, which, as they are very short in their duration, the mortality is much greater than one would readily suppose from the few persons that are ill at any one time: and as soon as a wet season succeeds a long dry one, a prodigious sickness and mortality come on universally. So long as this wet weather continues, the sickness scarcely abates, but the mortality diminishes rapidly; so that in the last number of rainy years, the number of deaths is at the minimum.

The change of a long dry season, whether hot or cold, to a rainy one, appears to bring about the temperature of air favourable to the production of great epidemics. Some, however, seem more speedily to succeed the predisposing state of the air, others less so; or it may be, that the state of air favourable to them exists at the very beginning of the change, whilst the state favourable to others progressively succeeds: of this last however, Dr. Sims is very uncertain. Two infectious diseases, it appears, are hardly ever prevalent together; therefore, although the same distemperature of air seems favourable to most epidemic disorders, yet some must appear sooner, others later.

From observation and books, the Doctor describes the order, in which these disorders have a tendency to succeed each other, to be plague, petechial fever, putrid sore throat, with or without *scarlatina*, dysentery, small-pox, measles, simple *scarlatina*, hooping-cough, and catarrh: "I do not mean by this," says he, "that they always succeed each other as above; for often the individual infection is wanting, when another takes its place, until perhaps that infection is imported from a place which has been so unfortunate as to have a coincidence of the two causes, without which it appears that no epidemic can take place, that is, a favourable disposition of the air and that particular infection. Whenever it happens that one infectious disorder takes the place, that should have been more properly occupied by another, it becomes much more virulent than it is naturally, whilst the former, if it afterwards succeeds, becomes milder in proportion: this perhaps is the reason why the same disorders, nay, the same appearance in a disorder, are attended with much more fatality in one year than another."

Dr. Sims gives a luminous, though concise abridgment of the materials from whence he drew these reflections, including a view of the epidemic constitutions for two centuries back, alleging, that Dr. Short's compilation, although the most copious, abounds with unparalleled absurdities and mistakes.

1. The *first epidemic constitution* was as follows: The years 1590, 1591, 1592, were all exceedingly dry; as was part of 1593; afterwards very rainy weather until the end of 1597. In 1593 the plague killed eleven thousand five hundred and three, in London; the same year it was prevalent in Alcmaar. A catarrh prevailed in 1597. The rainy weather began in Florence in 1592, during which a pestilential fever raged there, attended with a whitish tongue, and an inflammation, with ulcers about the throat and mouth.

2. There was, in 1598, an excessive heat and drought, which continued next year; 1600, a severe winter; 1601, a drought of five months' continuance; 1602, a cold spring and summer, cold dry harvest and winter; the rest of this constitution very rainy, until the end of 1608, except seven weeks' frost in 1607. In 1603 the plague was imported from Ostend, where, and in the Low-countries, it raged much, and killed thirty-six thousand two hundred and sixty-nine in London.

3. In 1609, three months' most rigorous frost, wherein the Thames became like a solid highway;

1610, an excessive hot dry summer, as were those of 1611 and 1612; 1616, 1617, and 1619. The winters of 1614 and 1615 great frost and snow; the rest of this constitution wet until the end of 1624. In 1609 the plague broke out in Alcmaar, as also in Denmark. In 1610 the Hungarian fever commenced in many places, and made great havock for several years, so as often to be denominated a plague. About the same time the malignant sore throat is supposed to have commenced in Spain where it killed incredible numbers. In 1611 the plague is said to have destroyed two hundred thousand at Constantinople. In 1614 the most fatal small-pox spread all over Europe. In 1618 the sore throat broke out at Naples, where it continued its ravages for twenty years; it was preceded by a similar disorder among cattle. In 1618 the plague existed in Bergen. In 1619 it broke out in Denmark and in Grand Cairo.

4. In 1625, a hard frosty winter, summer wet and hot; 1626 and 1627 excessively hot summers; 1630 and 1631 a great drought; the other years wet until 1634. In 1625 the plague killed thirty-five thousand four hundred and seventeen in London; it raged in Denmark both in 1625 and 1629; as also in 1625 in Leyden. In 1632 inflammations of the jaws prevailed, with an erysipelas in one or more parts of the body.

5. In 1634 an excessively frosty winter; 1635, 1636, 1637, and 1638, very hot and dry summers; then very rainy years until 1643. In 1635 the plague in Leyden, and the camp fever spread all over Germany. In 1636 the plague was in London, whereof died thirteen thousand four hundred and eighty; in 1637, the plague in Denmark.

6. The years 1643 and 1645 were remarkable for hot summers, followed by inconstant rainy seasons until 1650. In 1643 a fatal malignant fever was spread by the armies all over England; 1644, a malignant epidemic fever in Denmark; a similar fever in England, in which there was a roughness and sliminess of the throat and jaws, with pain, but scarcely any swelling or inflammation: it seemed only a mere defluxion, by which the sick seemed choaked, and for which astringent gargles were useful. In 1650 a general catarrh prevailed.

7. The years 1651 and 1659 had both very hot summers, and proved mostly dry; thence to 1665 very wet. The winters of 1651 and 1658 remarkably cold. In 1651, in the country about Rome, a contagious epidemic quinsey prevailed, and made terrible slaughter among children. A small ulcer arose in the mouth, for which juice of wood-sorrel, syrup of pomegranates, with the bark, and chiefly the acid of vitriol, were useful. All that took these medicines recovered, but those who were not tractable, and refused medicines, died: it did not seize adults, nor the aged. In 1654 the plague was in Denmark; and in 1655, and the two following years, it prevailed exceedingly in the south of Europe; the agues likewise of these hot years were malignant, and spotted fevers were very common. In 1664, after a mild rainy winter, a malignant purple fever raged in Prussia, and killed great numbers under twelve years of age, those only escaping who had no inflammation or œdematous tumor in the throat. Such as recovered, after sweating, had scales peeling off the skin; then adults had a swelling over their body and of their belly, which continued several weeks like leucophlegmatia, and then went off by sweat and urine. This epidemic seems a considerable deviation from their general progress laid down in the scheme of them already mentioned, and is therefore particularly noticed in this place.

8. In 1665, an excessively severe frost, which continued to the end of March, summer temperate; 1666, a very hot dry year, followed by two as wet and cold. In 1665, immediately after the frost, began the plague in London, which killed, according to the least computation, sixty-eight thousand five hundred and ninety-six. Since that time the plague has vanished from London, and all other epidemics seem to have become less malignant, owing to many causes; among which may, perhaps, be a greater use of fresh vegetable food, a less use of fish, an universal use of tea, superior cleanliness in our persons, a greater attention to the poor in times of scarcity, which are now scarcely felt in any extreme degree, and, lastly, the tremendous fire in 1666, since which the streets have been very much widened, and the houses so enlarged, that the same number of inhabitants now occupy above double the space. In 1667 an epidemic fever, with aphthæ, prevailed in Holland, in which acids were useful, but neither bleeding nor purging.

9. In 1669, the summer intolerably hot, after which the winter was as severely cold and frosty; 1670, a severe frosty winter; the rest of this constitution bad and wet. In 1669 a most fatal fever prevailed with slimy tongue, sore mouth, &c. in which bleeding was hurtful, but acids and laxatives very beneficial. Sydenham does not mention this fever, nor its return in 1678, although, next to the plague, they were the greatest epidemics in his time; which, together with his little knowledge of putrid fevers, can only be attributed to his practice lying about the court; whilst Morton, who practised in the city, gives abundant proofs that putrid complaints were as prevalent then as at this time. The same year, in Norway, malignant measles are said to have prevailed, with thrush, which, if mismanaged or neglected, ended in a fatal mortification. In 1675 a coryza, or cough, were prevalent.

10. In 1678, summer and harvest droughty, hot, and clear; 1679, winter long, severe frost, and intensely cold; 1680 and 1681, summer extremely dry and hot; the next two years rainy. In 1678

the same fever and sore throat prevailed as in 1669. In 1679, after a most deluging October, a catarrh was universal. In 1682, sphacelated tongues and *angina maligna* prevailed among cattle; in the same year, in Dublin, a fatal petechial fever.

11. The year 1684, was remarkable for the severest frost remembered at that time, succeeded by a very dry and hot summer, to which 1686 bore a near resemblance: the other years were rainy till 1691. In 1684, spotted fevers, particularly of the miliary kind, were common. This and the following year of 1685 are remarkable for the greatest number of burials; from 1665 to 1714, although 1684 does not contain St. James's, Westminster, and neither 1684 nor 1685 contain St. Ann's, Westminster, nor St. John's, Wapping, parishes which are inserted in every following bill of mortality, and which then buried above sixteen hundred annually at a medium. In 1688 an epidemic catarrh prevailed all over Europe.

12. A frosty winter in 1691, and excessively hot and dry summer. The same in 1694, the other years rainy and variable. In 1691 a fatal spotted fever prevailed; in 1693 an universal catarrh; and in 1695 the hooping-cough.

13. Of 1698, an exceedingly hard frost in the winter; the rest of this constitution rather rainy. In October, 1698, began a fatal contagious spotted fever, which spread all over England. Coughs attended most of the diseases in 1703.

14. The year 1704 was excessively dry, so that the grass was burnt up; this continued until August 15, 1705; the rest of this constitution cold and wet. In 1704 malignant spotted fevers were common. In 1708 coughs and coryzas prevailed every-where, so that few escaped.

15. In 1709, great frost all over Europe, and even in Portugal; 1712, a very frosty winter; the rest of this constitution variable. In 1709 the plague broke out in Dantzick immediately after the thaw, and killed twenty-four thousand five hundred and fifty-three. In 1710 the plague in Copenhagen killed twenty-five thousand. In 1712 sore throats universal in July and August, with dizziness and pains of the limbs, in London.

16. The year 1714, and the six succeeding years were all dry with hot summers. In the winter of 1716 so severe a frost that the Thames was covered with booths: that of 1718 likewise very frosty; the rest to 1731 cold, wet, and variable, except 1723, which was cold and dry; and 1729, which was a cold dry winter, followed by a hot dry summer. In 1720 the plague killed sixty thousand in Marseilles. In 1729 an universal epidemic catarrh prevailed in November.

17. The year 1731 was a very dry one, which continued until harvest 1732; summer of 1733 rather dry and pleasant, as was most of 1738; the remainder of this constitution extremely wet. In the beginning of 1733 was an epidemic catarrh; 1737, 1738, and 1739, were all much infested with catarrhal fevers, especially among children.

18. In 1740 was the severest frosty winter and spring that had happened for three hundred years; 1741, extremely dry hot summer; 1742, a variable, but dry year; the rest of this constitution wet or variable. In 1740 a malignant petechial fever made great havock in Bristol, and in Galway in Ireland. In 1741 it reached London, where this and the last year were the most mortal ever known, except when the plague reigned, the burials amounting to sixty-two thousand nine hundred and eighty. In 1742 the putrid sore throat broke out. In March, 1744, an epidemic catarrh was universal, and was more fatal than usual.

19. In 1747, there was an excessively hot dry summer; 1750, a dry year throughout, and intensely hot summer; the rest of this constitution moderate, variable, or wet. In 1747, and the succeeding years, the sore throat seemed to acquire new vigour, alarming the inhabitants of these kingdoms very much. In November, 1758, there was an universal epidemic catarrh.

20. The year 1760 was droughty from June 26 to September 16; the end of that and the following year severely wet, as was the end of 1763 and beginning of 1764; the rest of this constitution moderate. In April and May, 1762, a most epidemic catarrh.

21. A very dry year, and rather hot summer in 1765, as was the next year, though not quite so much so; the remainder of this constitution, moderate years, rather inclining to wet. During this constitution no very remarkable epidemic till the universal catarrh in November, 1775, unless we reckon such, the small-pox of the year 1772, which, succeeding a hard winter, were more fatal than they had ever been before in London.

22. The year 1776 was dry, and 1778 still more so. The winter of 1780 was the most frosty since 1740: yet these deviations from what might be accounted moderate weather were so small as scarcely to deserve notice. In May, 1782, there was a very general epidemic catarrh; and early in 1783, began the constitution which produced the epidemic *scarlatina anginosa*, which spread very considerably.

In describing these epidemics Dr. Sims purposely dwells most on their extremes; that is on those of the greatest and of the least malignity; that by omiting the middle ones, the difference might be most striking. He hopes that, by investigating minutely every circumstance that tends to produce or impede these infectious complaints, we may, in time, be able to obviate much of their malignity, and perhaps at last entirely stop their course.

EPIDERMIS, (επιδερμις: from επι, *upon*, and

δερμα, the true skin); the cuticle, or scarf-skin. The substance of the cuticle appears to be very uniform on the side next the skin, and to be composed on the other side of a great number of very fine small squamous laminæ, without any appearance of fibrous or vascular texture, unless we take into account the numerous small vessels by which it is connected to the parts underneath. It is very solid and compact, but yet capable of being extended and thickened, as we see by steeping it in water, and by the blisters raised on the skin by vesicatories or any other means; and from thence it would seem that it is of a spongy texture. It yields very much in swellings, but not so much as the skin without breaking or cracking. It is not readily destroyed by putrefaction.

Hard frictions loosen it insensibly, and presently afterwards a new stratum arises, which thrusts the first outward, and may itself be loosened and thrust outward by other strata. It is nearly in this manner that callosities are formed on the feet, hands, and knees; and the several laminæ or strata, observable at the same time on many other parts of the body, are owing to the same cause, though many anatomists have thought them to be natural. But it must be acknowledged, that, on the palms of the hands and soles of the feet, the cuticle is commonly thicker than on any other part.

The epidermis adheres very closely to the cutaneous papillæ under it; but it may be separated by boiling, or steeping for a long time in cold water. It adheres closer to the rete mucosum which is easily raised along with it; and they seem to be true portions or continuations of each other.

The cuticle is naturally white; and the apparent colour thereof is owing to that of the rete mucosum. For, if we examine the European and African, we find the cuticle to be nearly of the same colour in both, whereas the rete mucosum is very different.

The cuticle covers the skin through its whole extent, except at places where the nails are attached. It is marked with the same furrows and lozenges as the skin, and has the same openings and pores; and may be said to cover not only the whole external part of the body, but to line many of the large passages, as the alimentary canal, the lungs, vagina, urethra, &c. In these passages, however, it is somewhat different in its texture. The cuticle on the external parts of the body give passage to the ducts of the sebaceous glands, while that lining the cavities already mentioned, is pierced with the ducts of the mucous follicles.

When we examine narrowly the small passages through which the sebaceous matter of the skin passes, the cuticle seems to enter these, in order to complete the secretory tubes. The fossulæ of the hairs have likewise the same productions of the cuticle; and it seems to give a kind of covering to the hairs themselves. Lastly, the almost imperceptible ducts of the cutaneous pores are lined by it. If the skin be macerated for a long while in cold water, the cuticle, with its elongations, may be separated from it. By this observation we may explain how blisters may remain for a long time on the skin without giving passage, through these holes, to the matter which they contain; which holes, one would think, ought to be increased by this dilatation and tension of the cuticle. But when the cuticle is separated from the skin, it carries along with it part of these cutaneous fibres; which being compressed by the matter contained in the blister, shut the pores of the separated cuticle like so many valves; and it is probably these small portions which have been taken for valves of the cutaneous tubes.

With respect to its origin, some authors have supposed it to be formed by a moisture exhaled from the whole surface of the body, which gradually hardens when it is exposed to the air: but the fœtus in utero, where no air is admitted, testifies against this opinion; and it also grows readily under plasters applied to any part of the body. Leeuwenhoeck supposed its formation to be owing to the expansion of the extremities of the excretory vessels, which are found every where upon the furface of the true skin. Ruysch attributed its origin to the nervous papillæ of the skin; and Heister thinks it probable that it may be owing both to the papillæ and the excretory vessels. Morgagni, on the other hand, contends, that it is nothing more than the surface of the cutis, hardened and rendered insensible by the liquor amnii in the uterus, or by the pressure of the air. In fact, we know little about its origin: but the regeneration of it is very evident, sudden, and surprising: for, let it be destroyed ever so often, it still grows again as before.

The epidermis, being inorganic, is subject to no disease; unless we are to reckon such, its thickening, in consequence of pressure, to an inconvenient degree, as in the case of corns, &c. See Corns.

EPIDI'DYMIS, (επιδιδυμος; from επι, *upon*, and διδυμος, *a testicle)*; a hard vascular oblong substance, that goes round the outer and posterior margin of the testicle, to which it is joined with a good deal of cellular membrane. In its lower, middle, and more slender part, however, it partly adheres, and is partly free; so as to intercept a sort of impervious bag between itself and the testicle. The vascular cones, at the upper part of the epidydimis, by degrees uniting, form at length one duct, which composes the greater part of the testicle, and which grows larger as it descends, being largest at the bottom of the testicle; from whence again ascending along the

posterior face of the testicle, in a contrary direction, it by degrees spreads open its spiral convolutions, and comes out much larger, under the name of *vas deferens.*

The epididymis thus formed, may be reckoned a kind of *testis accessorius ;* and it resembles in some measure an arch supported by its centre or frame. It is more contracted at the middle than at the extremities, by which it is closely united to those of the testicle. Between its extremities it does not immediately touch the testicle; but is only loosely connected to it by the duplicature of a very fine and almost transparent membrane, as by a kind of ligament. This membrane is the continuation and duplicature of the tunica albuginea, or proper coat of the testicle; which, having supplied the place of a ligament to the epididymis, afterwards invests it.

The epididymis is flat, a little concave on the under side or that next the testicle, irregularly convex on the upper side or that turned from the testicle: and these two sides are distinguished by two angular edges; by the innermost of which it is connected to the testicle in the manner already said, but the outer edge and flat side are loose and free.

Besides the ducts which anatomists have commonly described in the epididymis, some have found a duct going off from the epididymis; but its termination was not well understood. It was supposed to terminate in the lymphatic system; in a few subjects Dr. Monro found such a duct rising from one end of the epididymis and running into the other end. By this description of the extremities and edges of the epididymis, we may discover, whether a testicle, viewed extra situm, belongs to the right or left side of the body.

EPIG'ASTRICS, (from *epigastrium);* the epigastric vessels. The external iliac artery divides into two branches at the *ligamentum Poupartii;* one of them is the epigastric, which runs to the inside of the rectus abdominis, at whose upper part it communicates with the internal mammary. Dr. Hunter observes, that in the operation for the femoral rupture, we risk cutting the *epigastric* artery, if we cut upwards and outwards; and if upwards and inwards, the spermatic is in danger, as the hernial sac lies in the angle between the two. The external iliac veins, a little before their going out of the belly, send off, from the inside, the *epigastric veins,* from whence branches run to the neighbouring glands, and up the recti abdominis muscles, and then, advancing, join the mammaria.

EPIGA'STRIUM, (from επι, *upon* or *above,* and γαστηρ, *the stomach);* a name given to the upper fore-part of the belly lying over the stomach. It reaches from the pit of the stomach to an imaginary line above the navel, supposed to be drawn from one extremity of the last of the false ribs to the other. Its sides are called *hypochondria,* and are covered by the false ribs, between which lies the epigastrium.

EPIGLO'TTIS, (επιγλωττις; from επι, *upon,* and γλωττις, *the tongue);* an elastic cartilage at the root of the tongue, and somewhat of the same figure, narrow and thick at the lower part, thin and slightly rounded at the upper part, gently convex on the foreside, and concave on the backside. It is situated above the anterior or convex portion of the cartilago thyroides; and its lower extremity is tied by a short, broad, and very strong ligament, to the middle notch in the upper edge of that cartilage. It is perforated by a great number of small holes, which are hidden by the membranes that cover its two sides. Two ligaments which connect the epiglottis to the notch of the thyroid cartilage, and to the basis of the os hyoides, and a third, which ties the basis of the os hyoides to the notch of the thyroides, form a triangular space filled with a cellular or fatty substance, and with small glands.

The epiglottis has likewise two lateral ligaments, by which it is connected to the arytenoides all the way to their points or cornua. It has also a membranous ligament, which, running along the middle of its anterior or concave side, ties it to the root or basis of the tongue. This ligament is only a duplicature of the membrane which covers the epiglottis, continued to the neighbouring parts. Lastly, there are two lateral membranous ligaments belonging to it, fixed near the glandular bodies called *amygdalæ.*

The epiglottis is not only perforated by the regular holes already mentioned, but has likewise a great number of small irregular fissures and breaks, which are so many different lacunae situated between its two membranes, and filled with small glands, the excretory orifices of which are chiefly on the posterior side of this cartilage.

EPIGLOTTIS, Spanish purple-flowering milk-vetch; a species of ASTRAGALUS.

EPILEPSIA, (επιληψια; from επιλαμβανω, *to seize upon*; so called, from the suddenness of its attack), the EPILEPSY; convulsions, with sleep, and usually froth issuing from the mouth. It is a genus of disease in the class *neuroses,* and order *spasmi* of Cullen, and contains nine species: 1. *Epilepsia traumatica,* arising from an injury of the head. 2. *Epilepsia à dolore,* from pain. 3. *Epilepsia verminosa,* from the irritation of worms. 4. *Epilepsia à veneno,* from poisons. 5. *Epilepsia exanthematica,* from the repulsion of cutaneous eruptions. 6. *Epilepsia à cruditate ventriculi,* from crudities of the stomach. 7. *Epilepsia ab inanitione,* from debility. 8. *Epilepsia uterina,* from hysterical affections. 9. *Epilepsia ex onanismo,* from the practice of onanism.

The epilepsy often attacks suddenly and without

giving any warning; but more frequently is preceded by a pain in the head, lassitude, some disturbance of the senses, unquiet sleep, unusual dread, dimness of sight, a noise in the ears, palpitation of the heart, coldness of the joints, and in some there is a sensation of formication, or of cold air, &c. ascending from the lower extremities towards the head. In the fit, the persons fail suddenly to the ground (whence the name of the *falling sickness),* frequently with a violent cry. The thumbs are shut-up close in the palms of the hands, and are with difficulty taken out; the eyes are distorted, so that nothing but the whites are to be seen; all sensation is suspended, insomuch, that by no smell, noise, or otherwise, nor even by pinching the body, can they be brought to themselves; they froth at the mouth, with a hissing kind of noise; the tongue is frequently lacerated by the teeth, and there is a violent convulsive motion of the arms and legs. Sometimes, however, the limbs, instead of being agitated by convulsive motions, are all stiff, and the patients are as immoveable as a statue. In children the penis is erected; and in young men there is an emission of the semen, and the urine is often thrown out to a considerable distance. At length there is a remission of the symptoms, and the patients recover after a longer or shorter interval; when they complain of a pain, torpor, or heaviness of the head, with a lassitude of all the joints.

The dissection of epileptic subjects has shewn a variety of morbid appearances, which may be supposed to have contributed to the disease; such as, indurations in the brain or meninges; caries of the internal surface of the cranium; projections of the bony substance of the same, pressing upon the brain; collections of serum or purulent matter, and earthy concretions within the skull; besides many others which are recorded by Bonetes, Morgagni, and Lieutaud. But often the causes are impossible to be discovered; for even in those who have died of the disease, the brain and all other parts of the nervous system have been apparently sound. The disease will attack strong as well as weak people; and in those who are subject to it, any considerable excess in drinking, a surfeit, violent passion, or venery, &c. will certainly bring on a fit. Some have epileptic paroxysms returning periodically after considerable intervals; and the disease has been thought to have some dependence on the phases of the moon.

If the epilepsy comes on before the time of puberty, there are some hopes of its going off at that time. But it is a bad sign when it attacks about the twenty-first year, and still worse if the fits grow more frequent; for then the animal functions are often destroyed, as well as those of the mind, and the patient becomes stupid and foolish. Sometimes it will terminate in melancholy or madness, and sometimes in a mortal apoplexy or palsy. It has sometimes, however, been observed, that epilepsies have been removed by the appearance of cutaneous diseases, as scurvy, small-pox, measles, &c. While the disease is recent, therefore, we are not to despair of a cure; but if it be of long standing, or hereditary, there is very little reason to expect that it can be removed.

From the symptoms occurring in epilepsy, which consist of involuntary convulsive motions, and an affection of the mental powers, there is reason to conclude, that the fit immediately depends on the induction of some peculiar action of the brain: but that convulsions may ensue from this cause, it would seem necessary that there should also occur, a peculiar disposition to action in the moving fibres. On this ground then we may suppose the cure to be chiefly expected on one of two principles; either by our being able to prevent the peculiar action of the brain, or to remove the disposition to action in the moving fibres. The first is chiefly to be accomplished by the removal of irritating causes; by preventing their influence from being propagated to the brain, when they are applied to remote parts; or by counteracting their influence, from inducing in the brain a state of action different from that to which they give rise. The second end is chiefly to be obtained by diminishing the mobility of the nervous energy, and strengthening the tone of the moving fibres. It must, however, be allowed, that in all convulsive disorders, excepting those which are cured by nature about the time of puberty, the cure by artificial means is very difficult. Numberless specifics have been recommended, but all of them have failed of answering our expectations. When the cause can be discovered, that must be removed. In other cases, the cold bath, valerian root, castor, musk, opium, the fœtid gums, Peruvian bark, with the whole tribe of nervous and antispasmodic medicines, have been recommended; but none of these, or indeed any combination of them, have been found generally useful; though the slighter, or symptomatic cases, may often be removed by them.

Dr. Home gives the following reports of different remedies tried for the cure of this and other convulsive diseases:—

1. The *cold-bath*, in one who had a convulsive disorder of one side, but the symptoms were rendered much worse by it.

2. *Venesection.*—Not to be depended on in convulsions.

3. *Electricity.*—In two convulsive cases was of no service.

4. *Epispastics.*—Do not seem to be powerful antispasmodics.

5. *Valerian.*—In nine convulsive cases, for which this remedy has been reckoned almost a specific, it not only made no cure, but could

scarcely be reckoned to do any good. Dr. Home supposes that it acts as a bitter tonic, something like the *serpentaria Virginiana.* Though much used at present, he tells us it has always appeared to him a weak, often a hurtful, medicine.

6. *Musk.*—Six convulsive patients treated with large doses of this remedy, were neither cured nor in the least relieved.

7. *Castor*, seems to be unworthy of the confidence formerly put in it. It is indeed possessed of a sedative power, and therefore may be useful in spasmodic feverish cases.

8. *Asafœtida* has considerable antispasmodic powers, but is not always successful. It heats and quickens the pulse; and is therefore improper in cases attended with inflammation. It disagrees with some from a peculiarity of constitution; exciting pain in the stomach, and vomiting; but this can be known only after the exhibition of the medicine.

9. *Cinchona.*—Of seven spasmodic cases, six were either cured or mitigated. An epilepsy of eight years' standing was very much relieved by taking the bark for a month, and one of two years' standing by taking it for ten days. But this medicine is of a heating nature, and therefore is not to be employed in cases attended with inflammatory symptoms.

10. *Peony root*, was given in two epileptic patients without the least success.

11. *Viscus quercinus*, or misletoe, was given in the quantity of two scruples five times a day to an epileptic patient, without success.

12. *Extractum hyosciami* was given to an epileptic patient, to one afflicted with the hemitotonos, and to one who laboured under the hysteric affection, without the least good effect.

13. *Folia aurantiorum* were exhibited with the like bad success. Five drachms of the powdered leaves were taken at once without any sensible effect.

14. *Cardamina pratensis*, in three epileptic cases, was not attended with any success.

15. *Opium* did no good.

16. *Cuprum ammoniacum* made no cure in four cases of epilepsy in which it was tried.

For some years past, the *oxid of zinc*, or *zincum calcinatum* (Lond.) have obtained great reputation in this and other convulsive disorders. This remedy was proposed by the celebrated Gaubius as an antispasmodic, in his *Adversaria;* and their efficacy has since been confirmed by various observations. In an inaugural dissertation, published by Dr. Hart at Leyden, the medical virtues of this, under the name of *flowers* of zinc, were considered. Glauber first proposed the internal use of them; and Gaubius discovered them to be the remedy of a celebrated empiric, Luddemannus, which he styled his *luna fixata.* After this he exhibited them with success in convulsive and spasmodic diseases. Dr. Hart supposes, that they act either as absorbents or as possessing a specific virtue; but is a strong advocate for their efficacy, on whatever principles they may operate; and, in favour of his opinion, relates seven cases in which they proved successful. A girl of seventeen years of age was seized with a slight *chorea* from a fright; and when the disease had continued six days, she began to take the calx of zinc, by which her disorder was removed in less than three weeks. Her cure required only sixteen grains of the calx. In a few months the complaints returned from the same cause, and were removed by four grains of the medicine divided into ten doses. A boy of about four years of age, labouring under a real epilepsy, suspected to be hereditary, was cured by a grain of the calx of zinc taken every day for some time. A man, fifty years old, thrown into convulsions from a violent passion, was cured by a grain of the calx taken every two hours. The disease had gone off upon venesection and the use of some other remedies; but returned again in two weeks, when it was finally removed by the zinc. The two last cases are related from Gaubius, who affirms that he has used the flowers of zinc in cases of the chincough, hysteric hiccough, and spasmus cynicus; that they frequently did more than other medicines, but were by no means successful in every case. The other cures mentioned by Dr. Hart are similar to those above mentioned. But it does not appear that he ever saw a confirmed epilepsy cured by this medicine.

In the first volume of *Edinburgh Medical Commentaries*, we have an account by Mr. Benjamin Bell, of a man afflicted with a confirmed epilepsy, who was considerably relieved by the same remedy. He was about thirty-five years old, and had been subject to the disease for ten years. At first the paroxysms did not return oftener than once a month; but becoming gradually more frequent, they came at last to be in a manner continual, insomuch that he would have ten, eleven, or twelve attacks in a day, and very seldom had an interval of twenty-four hours. His memory and judgment were so much impaired, that he could scarce answer a question distinctly. He had used a great variety of medicines without any benefit. About three years before applying to Mr. Bell, he had violent rheumatic pains in his limbs, which left such an extreme debility that he was never afterwards able to get out of bed without the assistance of two or three people. On the 22d of October, 1772, Mr. Bell found him in the abovementioned condition, and prescribed as follows:

℞ Zinc. calcin. gr. xxiv.
Ext. Gentian. ʒj.
M. f. mass. et divid. in pill. xxiv. cap. j. mane et vesp.

He continued to take two pills a-day till the 1st of November, without any sensible benefit. The dose was then doubled, and continued till the 12th; when the fits, though equally violent, became less frequent. The medicine was gradually augmented to ten pills thrice a-day; and the consequence was, that his memory and understanding returned, the fits became much slighter and less frequently repeated, though the disease could not be radically subdued.

In a young man labouring under the epilepsy, in whom the fits were preceded by an *aura epileptica*, or sensation like air arising from the inside of the knee joint, the disease was also relieved, but not cured.

Dr. Percival relates some cases of epilepsy which seem to have been cured by the zinc; and in other cases, where the disease was not entirely removed by it, the spasms were nevertheless much mitigated. He did not observe that it promoted any evacuation; excepting that in some, upon being first taken, it occasioned a little sickness, which went off with a stool. He adds, that those apothecaries who do not prepare this medicine themselves, are in danger of being imposed upon, as it is sometimes a mere corrosion of the zinc by an acid, and even imperfectly washed.

The good effects of calcined zinc as an antispasmodic are also attested by Dr. Haygarth of Chester, and Dr. White of York. The former gives a test of their goodness, which may be of use to those who do not prepare them, namely, that the flowers of zinc, when strongly heated, become yellow, but reassume their white colour on being allowed to cool. The latter gives a case of hieranosos, or strange convulsions of almost all the muscles of the body, cured by zinc, after a number of other remedies had failed. The patient, however, had been formerly much relieved by Ward's antimonial pill.

In Dr. Home's clinical experiments and histories, also, calcined zinc is mentioned as having been found serviceable, upon trial, in the Royal Infirmary of Edinburgh.

That in many cases all these remedies have been employed without success, is not to be denied; and indeed it may with confidence be asserted, that a great majority of cases of epilepsy are incurable by any remedy that has yet been discovered. At the same time, as there is incontrovertible evidence that some of them have succeeded, at least in certain cases, the more powerful may always be considered as deserving a fair trial.

The *cuprum ammoniacum*, in particular, seems well entitled to the attention of practitioners; for though it may be a medicine of great activity, yet under prudent administration, it may be employed, even with very young snbjects, without any hazard; and in several inveterate cases, which had obstinately resisted other medicines, it has brought about a complete recovery. The powers of this medicine indeed have been evinced by a very extraordinary accident. A young woman who was an attending patient at one of the public medical institutions in Edinburgh, rashly took, for a single dose, a whole box of pills which had been given her to take in gradual and increasing doses. The effects were proportionably violent, and her life was despaired of; but the event was, that she not only recovered from the effects of the medicine itself, but never after had any return of her epilepsy.

EPINY'CTIS, (επινυκτις; from επι, *on*, and νυξ, *night)*; a pustule, which rises in the night, forming an angry tumor on the skin of the arms, hands, and thighs, of the size of a lupine; of a dusky red, and sometimes of a livid and pale colour, with great inflammation and pain. In a few days however, it breaks, and sloughs away entirely.

EPI'PHORA, (επιφορα, from επιφερω, *to carry forcibly)*, the watery eye, a genus of disease in the class *locales*, and order *apocenoses*, of Cullen. By the term Epiphora, Mr. Ware says, is meant, an accumulation of tears on the anterior part of the eye; in consequence of which, the person afflicted with this disorder is not only under the necessity of frequently wiping them away, but vision is injured by the morbid refraction which they produce in the rays of light that enter the pupil. This disorder may be occasioned either by a more copious secretion of tears than the puncta lachrymalia are able to absorb, or, which Mr. W. considers the more frequent cause of this malady, by an obstruction in the lachrymal canal, in consequence of which the tears are prevented from passing freely from the eye into the nose.

Anatomists formerly supposed the tears to be secreted solely by the glandula lachrymalis; but the observations of the moderns have given rise to an opinion, not only that a part of them transudes through the pores of the conjunctiva and cornea, but that their quantity is increased, and that their acrimony is also abated, by the united secretions of the caruncula lachrymalis, and glandulæ Meibomii.

When an Epiphora is produced by a too copious secretion of tears, if this do not depend on any mental affection, its more remote cause usually is, *an inflammation in the membranes of the eye;* and in such a case, of course, its cure will be accomplished by the removal of the inflammation in the manner proposed under OPHTHALMIA; after which the eye may be strengthened by mild astringent applications, such as cold water, either alone, or mixed with small proportions of vitriolated zinc or of verjuice.

But the species of the Epiphora which Mr. Ware thinks more particularly worthy of consideration, is produced by an obstruction to the free passage

of the tears from the eye into the nose. This obstruction, he says, may take place, either in the ducts leading from the puncta lachrymalia into the lachrymal sac, or in the sac itself. When the ducts are obstructed, a case which, however, rarely occurs, the tears fall over the cheek, and the sac is constantly empty. Pressure on the sac, therefore, produces no regurgitation either of tears or of mucus into the eye. "The method of cure" says Mr. Ware, "is here evident. A small probe of a suitable size must be introduced through the puncta of the obstructed ducts into the sac; and this operation daily repeated, until the obstruction be removed. But the part in which the obstruction more commonly lies, is in the sac itself; and in this case, the tears, mixed sometimes with mucus, flow back into the eye through the puncta, when pressure is made on the sac. Without adverting at present to the bony duct of the os unguis, (in which a part of the lachrymal sac is lodged,) a disease of which duct occasionally causes an Epiphora, and in general terminates in a Fistula Lachrymalis, an obstruction to the passage of the tears may be produced either by a thickening of the membrane which lines the sac; by the lodgement of inspissated mucus in the inferior portion of this cavity; or by a spasmodic action in that part which has been called by some a sphincter of the sac. These three causes of the obstruction not only take place separately, but sometimes exist together; and they mutually tend to increase each other.

"It is well known that mucus is secreted by the membrane which lines the lachrymal sac, in like manner as it is secreted by the pituitary and other membranes. This mucus, when in its natural state, is perfectly limpid, and, mixing with the tears, passes with them into the nose; but when the membrane which lines the sac is diseased, it often happens that the mucus secreted by it is thickened; in consequence of which, it becomes incapable of passing through the sac, and the tears by its lodgement are prevented from pursuing their regular course; their descent being probably still further interrupted by a spasmodic action in the inferior part of the sac, which, as has just been observed, is by some supposed to form a sphincter sacculi."

Various remedies have been proposed for the cure of the Epiphora by different surgeons. But Mr. Ware has found none of approved efficacy, except the method first recommended by M. Anel, in the year 1712, and that by Mr. Blizard, in the year 1780. In some few instances, indeed, stimulating applications, such as the unguentum hydrargyri nitrati, and the *unguentum ad lippitudinem* of St. Thomas's Hospital in London, (in which hydr. nitrat. rub. is the principal ingredient), when applied to the edges of the lids, and *rubbed into the skin* which covers the lachrymal sac, have been likewise, found to afford relief. Stimulating remedies, drawn up the nose, in order to increase the secretion of the pituitary membrane, have been said to possess some efficacy. But, notwithstanding the favourable effects which these remedies may occasionally have produced, practitioners well know, that the assistance they are capable of affording, is very uncertain; and, if thought adviseable, they may be adopted in perfect conformity with the mode of cure which Mr. Ware recommends.

Anel's method consists in first passing a probe, and afterwards injecting a liquor, through the puncta lachrymalia, in order to clear away the matter which obstructs the lachrymal passage. By these means, he asserts, that he performed many remarkable cures; but Mr. Blizard endeavoured to improve on this treatment, by injecting quicksilver into the lachrymal sac instead of water, on the supposition, that the former would act more powerfully in consequence of its great specific gravity. Mr. Ware, however, from its success in several cases, is led to prefer the use of warm water, the injection of which he performs in the following way:

"When I use the syringe," says he, "I find it convenient to stand either behind the patient, or on the side opposite to that of the diseased eye; and always high enough to give me a full command of the patient's head. The syringe being held in the right hand, the eye-lid should be drawn downward, and a little onward, with the forefinger of the left hand. This will bring the inferior punctum fully within sight of the operator, and will place it in a position very convenient for the purpose of admitting the point of the pipe. When the pipe is introduced, the finger should be removed from the lower lid, and be applied as accurately as possible over the superior punctum, to prevent the liquor from escaping through it; and with this finger the lachrymal sac should occasionally be compressed, in order to assist the determination of the liquor downward into the nose."

When the obstruction to the passage of the tears is produced solely by the lodgement of inspissated mucus in the nasal duct, and is unaccompanied by any tumefaction in the membrane which lines this part, the injection of any warm liquor is sufficient, merely by its mechanical power, to remove the mucus, and accomplish a cure; but, when this lodgement is accompanied with *a tumefaction of the membrane which lines the duct*, such an injection would be much more advantageous if impregnated with vitriolic, or saturnine materials. These may also be assisted by taking away a small quantity of blood from the vessels, near the lachrymal sac, either by the application of a leech, or by puncturing the angular vein. On the other hand, if the obstruction be occasioned by a *spasmodic constriction in some part of the lachrymal canal*,

astringent applications may rather tend to increase the constriction; and the remedies that seem rather to be indicated are those of a relaxing and sedative nature.

It is not easy, however, at all times, to discover the precise cause of the obstruction, consequently, we cannot always immediately ascertain the peculiar mode of treatment that ought to be adopted. Although, for instance, the lodgement of inspissated mucus in the lachrymal sac is often accompanied by a tumefaction of the membrane which lines the nasal duct, it may also take place without any such tumefaction: and although a spasmodic constriction in a part of the nasal duct, may only produce at first a retention of tears in the lachrymal sac, without altering the consistence of the mucus secreted by it, yet the tears, being retained, will necessarily acquire some degree of acrimony, and these, irritating the sac, will soon produce an inspissation of the mucus secreted by it.

Under these uncertainties, therefore, Mr. Ware advises us, in general, to begin the treatment by injecting some warm water through the inferior punctum lachrymale, repeating the operation for four or five days in succession. In those instances, however, in which he has found it impossible, after several attempts, to inject any part of the liquid through the duct, he has had recourse to the introduction of a golden probe, about the size of a bristle, through the superior punctum lachrymale. Attending to the direction of the duct, he insinuates this through the obstruction, and conveys it fully into the nose. Immediately after this, a liquid, injected through the inferior punctum, passes without any difficulty; and by repeating these operations, for a few successive days, Mr. Ware, in many instances, has cleansed the passage, and compleated the cure. In slighter instances, a strong sternutatory powder, snuffed up the nose, about an hour before bed-time, by exciting a large discharge from the Schneiderian membrane, has sometimes contributed to open the obstruction in the nasal duct.

When the epiphora is occasioned by a polypous tumor in the nose, obstructing the inferior aperture of the nasal duct, it can only be relieved by the removal of the polypus that occasions the obstruction. See POLYPUS. So likewise when the epiphora is accompanied with an ozæna, this latter disorder must be removed before the cure of the former can be accomplished. See OZÆNA.

EPIPHYLLOSPE'RMOUS (of επι, *upon*, φυλλον, *a leaf*, and σπερμα, *seed*); in botany, an epithet applied to such plants as bear their seeds on the back of their leaves, as do all capillary plants.

EPI'PHYSIS, (επιφυσις, from επι, *upon*, and φυω, *to grow*); any portion of bone growing upon another, but separated from it by a cartilage. See BONES.

EPIPLOCE'LE, (επιπλοκηλη, from επιπλοον, *the omentum*, and κηλη, *a tumor*); an omental hernia: a rupture produced by the protrusion of a portion of the omentum. See HERNIA.

EPIPLO'IC APPENDAGES. See APPENDICULÆ EPIPLOICÆ.

EPIPLOI'TIS, (επιπλοιτις, from επιπλοον, *the omentum*); an inflammation of the process of the peritoneum, that forms the omentum. See PERITONITIS.

EPIPLO'ON, (επιπλοον, from επιπλοω, *to sail over*, because it is mostly found floating, as it were, upon the intestines). See OMENTUM.

EPISCHE'SES, (επισχεσις, from επισχεω, *to restrain*); a suppression of excretions. It is an order in the class *locales* of Cullen's Nosology.

EPISPA'STICA, (επισπαστικα, from επισπαω, *to draw together*); *epispastics*: those substances which increase the action of the vessels, in those parts of the surface of the body to which they are applied, in such a manner as to produce an efflux of fluids there. Cantharides, squills, boiling water, &c. have this effect. See CANTHARIDES, &c.

Medicines are generally divided into such as act, 1. on the solids, 2. on the fluids: and blisters may be considered as belonging to each of these classes; though their relation is chiefly to the former. But here a question occurs, whether epispastics produce their effects by their external action on the body, or by the absorption of their stimulating particles into the system? This is fully and ingeniously discussed by Dr. Percival, in his Essays Med. and Exper. Vol. I. He considers the operation of blisters, under two divisions; *first*, as they affect the living solids: *secondly*, as they act upon the fluids.

He says, the diseases of the *solida viva*, in which blisters are indicated, are very numerous; but taking a more general view of them, they may perhaps be reduced to three kinds. 1. *When the action of the moving fibres is, either partially or universally, too weak.* 2. *When it is irregular.* 3. *When it is partially too strong.*

In the first case vesicatories are indicated, as a stimulus to the languid solids, to rouse them to more vigorous contractions, to support the *vis vitæ*, and to promote the salutary secretions. They tend to quicken the circulation, to raise the pulse, and to animate the whole system. Hence we may deduce their use and operation—

(1.) In *low nervous fevers;* when the spirits sink, when the contractions of the heart grow languid, and the unhappy patient struggles under anxiety, restlessness, delirium, difficulty of breathing, and a load and oppression about the *præcordia*. These symptoms, according to Huxham, arise from debility, and denote a kind of nervous orgasm, or spasm of the vitals, which requires cordial medicines, aided by the application of blisters. It has,

indeed been observed, that in these fevers, epispastics sometimes aggravate all the symptoms, and by their irritation occasion a small and contracted pulse. But this is ascribed to a mistake, either in the time, or place of their application. On the first signs of a delirium, when the urine turns pale, when the patient sighs, is anxious, and becomes dull of hearing, or when his eyes sparkle and look staring, &c. he advises to cover the whole head with a blister. The epispastic will thus be applied as nearly as possible to the part affected; and as the head is less sensible to the stimulus of cantharides, than any other part of the body, all the bad effects, arising from too great irritation, will be prevented. Dr. Percival, however, apprehends, in the class of diseases now under consideration, that the utility of blisters must always be attended with a peculiar degree of uncertainty. This depends, he says, on the nature of these fevers, and the concomitant state of the nerves. Whenever they are accompanied with little pain, but with a high degree of irritability, which is not unfrequently the case, blisters, he thinks, will be found prejudicial, by increasing the spasm, and throwing the system into confusion. But if the body, however languid and enfeebled, has been accustomed, through the course of the disease, to the stimulus of pain, or if the nerves be not affected with an excess of sympathetic sensibility, epispastics may be applied with safety and advantage.

(2.) In the advanced state of *inflammatory fevers*, when the patient becomes languid, or perhaps comatose, blisters are highly serviceable. And they are found to be very efficacious in removing those obstinate and oppressive head-achs, which have resisted every previous evacuation, and which often continue to the last period of the disorder. The same observation holds true in every other species of fever, where such a train of symptoms occur as have been already described.

Even in malignant *petechial fevers*, notwithstanding the great dissolution of the blood, and the supposed tendency of cantharides to increase that dissolution, some of the most eminent practitioners have been bold enough to recommend blisters. And in the *malignant ulcerous sore throat*, it must be acknowledged that they are productive of the best effects. Nevertheless, Dr. Percival thinks blisters should be applied with the utmost caution, *in all cases, attended with an highly putrid, and dissolved state of the fluids:* for, he says, under such circumstances, they often exhaust the strength of the patient, by exciting an immoderate discharge of bloody serum; and they sometimes occasion a sudden and fatal mortification.

(3.) In the *small-pox*, when the patient is of a lax and weak habit, when the pulse is low, feeble, and depressed; and the fever insufficient for the expulsion and suppuration of the pustules, epispastics are certainly indicated. When the pocks are of the bloody kind, and attended with delirium, Dr. Mead assures us that blisters may be used with equal safety and advantage. And in this distemper, whenever the maturation of the pustules does not regularly succeed their eruption, and when anxiety, inquietude, difficulty of breathing, and delirium come on, the fever should be quickened by warm cordial medicines, and especially by the application of blisters. This is also confirmed by the testimony of the celebrated Tissot.

(4.) In the *apoplexy*, whether arising from over distended vessels, injuring the brain by pressure, from the effusion of blood within the *cranium*, or from a pituitous collection there; after attempting to relieve the head by bleeding, cupping the *occiput*, with deep scarifications, and using such other evacuations, as the state of the patient may require, blisters may be applied, both to the head and extremities, with great advantage. By increasing the circulation of the blood externally, and by producing a considerable discharge of serum, they will unload the vessels of the brain; whilst, by their stimulus, they rouse the torpid system of the nerves, excite the heart and arteries to quicker and more vigorous contractions, and thus powerfully contribute to restore the equilibrium between the *vis motrix*, and *moles movenda*.

(5.) In the *palsy*. When this disease invades the whole body, blisters are useful by their general stimulus. But they are most efficacious when the paralytic affection is not universal, but confined to some particular member or organ. Thus in palsies of the upper extremities, vesicatories applied to the *vertebræ* of the neck, and going obliquely to the shoulders, are remarkably useful. And when the disease attacks the lower extremities, they are equally efficacious, when laid upon the extremities themselves. As most of the nerves which go to the bladder, pass through the *foramina* of the *os sacrum*, vesicatories have been very successfully applied to that region, for the cure of an incontinence of urine. And it is probable, that they would be much more certain and powerful in their operation, if a proper attention were paid, in their external application, to the origin and course of the nerves.

(6.) In the *gutta serena*, when it proceeds from a paralytic affection of the retina, blisters applied to the forepart of the head, so as to cover the nerves which issue through the *supra* orbital *foramina*, and spread themselves on the forehead, are highly serviceable, as most practitioners have experienced.

(7.) In *tympanites*, Celsus advises to make ulcers in several parts of the belly, and to keep them running. But we are furnished, by means of epispastics, with a much more effectual, as well as more humane remedy. Dr. Mead recommends their application in this disorder: and it is probable they

may do service, both as stimulants and antispasmodics, except when the case is complicated with a mortification of the bowels.

Blisters in the *rickets*, are recommended by Boerhaave, to stimulate the languid vessels, and resolve the mucous concretions. In *schirrous tumors* of the conglobate glands of the neck, blisters applied to the head, or behind the ears, have a good effect. They have also been found useful in those schirrous, or œdematous, tumors of the joints, usually called *white swellings;* but their operation should be assisted by the internal use of cinchona, calomel, or other alterative and deobstruent medicines. Other diseases, arising from the too weak action of the solids, might be enumerated.

When *the action of the moving fibres is irregular*, vesicatories are indicated, both as stimulants and antispasmodics. *Convulsive motions* or *spasms* seem generally to arise from some peculiar irritation of the nervous system. And whether the brain be originally, or only sympathetically, affected, whatever rouses and engages the attention of the mind will seldom fail to afford relief, by lessening, or destroying, the sense of that irritation. Blisters therefore are indicated in such diseases, to stimulate and excite pain, in a part of the body that is sound. Hippocrates says, "*when two pains occur, but not in the same place, the greater obscures the less.*" Dr. Whytt relates the case of a patient, who had an alternate motion of the muscles of the *abdomen*, which was cured by a circular blister, of about eight inches diameter, applied to the part affected. The same author acquaints us, that where epilepsies take their rise from an uneasy sensation in some part of the arm or leg, he has found vesicatories, applied to those parts, the most effectual remedies.

In the convulsions which sometimes precede the eruption of the *small-pox*, blisters act as powerful antispasmodics. But they should not, upon slight occasions, be employed in this state of the disease, as by their stimulus they may aggravate the fever, and increase the number of pustules.

In the idiopathic *epilepsy*, the application of vesicatories to the head is recommended by Hoffman, Riverius, Piso, and Mead. The former found epispastics of excellent use, in the *spasmodic asthma;* and Whytt confirms the testimony of Hoffman by his own experience.

In *fixed pains of the bowels*, from spasms, though there are no evident marks of inflammation, the application of blisters to the *abdomen* may be recommended. Sir John Pringle assures us, that he has oftener than once seen a patient relieved in his bowels, as soon as he felt the burning of his skin; and at the same time have stools by a purge, or a clyster, which had not operated before. In severe, and continued vomitings, when the stomach is affected with very painful, convulsive motions, Dr. Percival observed the most salutary effects, from the application of a vesicatory to the epigastric region. Hence we may conclude, that blisters act not, in such cases, as evacuants, but as antispasmodics.

When *the action of the solida viva is too strong*, the propriety of resorting to epispastics is yet a subject to be settled amongst physicians. In inflammatory fevers, Hoffman and Baglivi bear the strongest testimony against their application in such cases. Sir John Pringle's early practice, in every inflammatory fever, was to blister; but afterwards, when he found that a solution of the fever was not to be procured by such means, he confined the use of epispastics to particular states of the disease. Huxham says, that blisters, in the beginning of inflammatory fevers, add fuel to the fire; and Dr. Whytt, that, in fevers where there is no partial obstruction or inflammation, vesicatories are of little service, and sometimes hurtful; unless perhaps towards the end of the disease, when the pulse begins to sink.

On the other hand, Sydenham, whose authority must have great weight, from his accurate attention to the *juvantia* and *lædentia* in all diseases, adopted the use of blisters in the continued acute fever, which prevailed in the years 1673, 1674, 1675. The symptoms of this fever, as he describes them, indicate a very high degree of inflammation; and his practice was, first to take away a sufficient quantity of blood from the arm, and then to apply a large epispastic to the neck. Yet, at the same time, he employed the cooling regimen.

May not the truth of this, says Dr. Percival, as in most other litigated points, lie between these opposite opinions? If so, the following conclusion may perhaps be justified: that whenever the inflammatory *diathesis* prevails strongly and uniformly throughout the system, and no one part is more affected than the rest, vesicatories are pernicious and detrimental. But when peculiar symptoms of inflammation attack the head, the lungs, &c. and prevail more in those parts, than the rest of the body, blisters are indicated, and often prove remarkably useful. And in such cases, they are found from experience to lessen the impetus of the blood upon the vessels of the inflamed part, to abate the fever and heat of the body, and to diminish the quickness of the pulse. Upon these principles, Dr. Percival explains the action, and deduces from them the uses, of epispastics, in the following diseases.

(1.) In the *symptomatic phrenitis* or *delirium*, which accedes indifferently to the bilious, malignant, or inflammatory fever. If the lowness of the pulse forbid venæsection, the cure must be attempted by leeches and blisters. Dr. Whytt says, that in fevers, where the substance of the brain is affected, and not its membranes, he has never

found any benefit from the use of blisters. And he always suspects the brain to be affected, when a fever and delirium come on, without any preceding head-ach, or redness in the *tunica albuginea* of the eyes. This kind of fever he met with several times, and has observed it to be generally fatal. But Dr. Percival furnishes an exception to this valuable observation, in his volume of Essays already referred to.

(2.) In *ophthalmia*, the use of blisters is too generally known to be dwelt on in this place. See Ophthalmia.

(3.) In *nasal hæmorrhages*, blisters applied to the back, Dr. Cullen says, have been of service; and may we not from analogy therefore conclude, that they would be equally useful in *hæmoptöe?*

(4.) In the *inflammatory angina*, Sydenham recommends the application of a large and strong epispastic between the shoulders, having premised bleeding and purging. Sir John Pringle mentions another remedy, whose mode of operation seems to be similar to that of blisters; viz. the application of a piece of flannel to the throat, moistened with two parts of *olive oil* and one of *liq. volat. corn. cerv.* or in such a proportion as the skin will bear. By this means the neck, and sometimes the whole body, is put into a sweat. But Dr. Percival imagines it is not by the *diaphoresis*, so much as by the *revulsion* which it produces, that this application is so efficacious: and upon this principle, he supposes a blister would be still more serviceable. Its operation indeed, he says, would not be so quick; but the copious derivation of serous humours, from vessels nearly connected with the inflamed parts, would much more than balance the comparative slowness of its operation.

(5.) In the *angina maligna*, a blister applied early to the nape of the neck, or to each side of the throat, produces very salutary effects. But as the skin in this disease is particularly disposed to inflammation, some inconvenience is apt to arise from the too powerful stimulus of the cantharides. Dr. Percival therefore directed the *emp. canthar.* to be mixed with an equal or double proportion of the *emplast. stomachicum*, and to this composition, he added a drachm or two of camphor, properly comminuted with rectified spirit of wine. Besides being sufficiently efficacious as a blister, these antiseptic ingredients coincided with the general indication of correcting putrefaction.

"If a blister plaster, after being moderately warmed before the fire, be covered with a fine soft piece of muslin, it will occasion much less irritation; produce no strangury, or but in a slight degree: and, when it is to be removed, will separate from the skin with great facility: nor will such a covering prevent its vesicating effects. Hence blisters may, in this manner, be applied with advantage, whenever the skin is disposed to erysipelatous inflammation, from its extreme sensibility; or when their evacuating powers are wanted, with a diminution of their stimulus. In puerperal cases also, they may thus be used, without danger of inflaming the *uterus*, by their action on the urinary passages."

(6.) In *peripneumony*, especially when the inflammation is great, repeated bleeding is the principal remedy; and Dr. Whytt dissuades us from the early application of blisters. But when the disease is of a mixed kind, when the lungs are not so much inflamed, as loaded with a pituitous matter, when bleeding gives but little relief, when the pulse though quick is small, when the patient is not able to bear evacuations, and the disease has continued for some time, in such circumstances epispastics will produce remarkably good effects. See Peripneumonia.

(7.) In the *chronic asthma*, when the patient's strength is very much reduced, blisters, though highly efficacious, should never be applied to the chest, when the *dyspnœa* is very severe; because they render the motion of the intercostal muscles more difficult and painful, as well as obstruct respiration, by their pressure and tenacity. In these cases volatiles are peculiarly useful.

In *coughs*, attended with fever, pain in the side, and a pituitous infarction of the lungs, blisters are highly efficacious, in abating the fever, lowering the pulse, and removing the inflammatory obstruction. In the *hepatitis* also, and other inflammations of the viscera, one of the best remedies is a large blister laid upon the part affected. See Hepatitis, &c. Blisters are remarkably serviceable in the *diarrhœa which sometimes attends the measles;* probably because they lessen the inflammation, which in this disease falls on the intestines. In the *rheumatism*, *sciatica*, and *gout*, Hoffman commends their use. Sir John Pringle advises their application to the part affected, in the two last; and Dr. Cullen asserts, that they seldom fail in the rheumatism, when applied before the part swells.

Dr. Percival says, *the operation of blisters on the fluids* depends upon their medicinal powers, as attenuants and evacuants; and these, perhaps, arise solely from their stimulus on the solids. By quickening the alternative contractions of the vessels, they prevent the stagnation of the juices; hence their attenuating effects: and by exciting an inflammation externally, they occasion a flux of humours to the skin, and a consequent evacuation of them. It seems therefore to be almost unnecessary, to consider vesicatories as belonging to this second class of medicines, but Dr. Percival gives some interesting particulars, relating to their operation as evacuants, which will be found in the volume of Essays already referred to. The use of epispatics in *nervous fevers*, in *anasarca*, in particular states of the *small-pox*, and in the *convulsions* of infants,

is fully shown. The last of these contains practical matter of too much importance to be passed over.

When an infant is arrived to a certain growth, an eruption, called the red-gum, usually appears on the surface of its body, and frequently at the same time, there is a discharge from the glands behind the ears, and in the groin. During these excretions, the child, for the most part, is lively and well; but as the equilibrium of health, in such delicate subjects, is easily disturbed, their continuance is very precarious. And if some new evacuation be not substituted, disease will unavoidably ensue. For so exquisite is the sensibility of the nervous system in children, that a very slight degree of irritation will, in their tender bodies, excite convulsions. In such circumstances, the utility of blisters is obvious, and might be inferred even *à priori*, if experience had not given a sanction to their application. But their good effects are warranted by the most undoubted testimonies. And as a proof, how salutary it is to promote the discharge of the superabundant juices in children, Willis relates the case of a girl, who was subject to the epilepsy, and in one of her fits fell into the fire, and burnt her face and forehead in the most shocking manner. The accident however was attended with this good effect, that as long as the ulcers remained open, she was free from the disorder. Hollerius furnishes us with a similar example. A girl had, from her infancy, a running sore in her head: it was suddenly healed, and she became epileptic. Variety of remedies were tried to no purpose: Duretus was consulted, who recommended the application of beet leaves to her head, which brought on a large discharge, and removed her epilepsy. Agreeable to this is the observation of Hippocrates, that "running sores of the head happening to children, prevent convulsions."

EPISTAPHILI'NUS. See UVULA.

EPISTA'XIS, (επιϛαξις, from επιϛαζω, *to distil from);* a bleeding at the nose, with pain, or fulness of the head. It is a genus of disease, arranged by Cullen, in the class *pyrexiæ* and order *hæmorrhagiæ*. The milder species of this hæmorrhagy comes on more frequently in summer than in winter, and for the most part without giving any warning, or being attended with any inconvenience; but the less benign kind is preceded by several remarkable symptoms. These are congestions of the blood, sometimes in one part, and sometimes in another, and which are often very troublesome in the sides of the head; there is a redness of the cheeks; an inflation of the face, and of the vessels of the neck and temples; a *tinitus aurium;* a heavy pain of the eyes, with a prominence, dryness, and sparks; there is a vertiginous affection of the head, with an itching of the nostrils, and a sense of weight, especially about the root of the nose. In some the sleep is disturbed with dreams about blood, fire, &c. Frequently the belly is costive; there is a diminution of urine, a suppression of sweat, coldness of the lower extremities, and tension of the hypochondria, especially the right one.

This hæmorrhagy may occur at any time of life; but most commonly happens to young persons, owing to the peculiar state of the system at that time, ακμη, and during the state of manhood; at which time it is attributed to a plethoric state of the system; to a determination of the blood, by habit, to the vessels of the nose, or to the particular weakness of those vessels.

In all these cases the disease may be considered as an arterial hæmorrhagy, and depending upon an arterial plethora; but it sometimes occurs in the decline of life, and may then be considered as the sign of a venous plethora in the vessels of the head. It often happens at any period of life in certain febrile diseases, which are altogether or partly of an inflammatory nature, and which show a particular determination of the blood to the vessels of the head. As, by this evacuation, other diseases are often removed, it may on these occasions be deemed truly *critical*. It happens to persons of every constitution and temperament; but most frequently to the plethoric and sanguine, and more commonly to men than women.

In young people the bleeding at the nose may be considered as a slight disease, and scarce worth notice. But, even in young persons, when it recurs very frequently, and in great quantity, it is alarming; and is to be considered as a mark of an arterial plethora, which in the decline of life may give the blood a determination to parts from which the hæmorrhagy would be more dangerous. And this will require more particular attention as the marks of plethora and congestion preceding the hæmorrhagy are more considerable, and as the flowing of the blood is attended with a more considerable degree of febrile disorder. These consequences are more especially to be dreaded, when the epistaxis happens to persons after their ακμη, returning frequently and violently. Even in the decline of life, however, it may be considered as in itself very salutary; but at the same time it is a mark of a dangerous state of the system, *i. e.* of a strong tendency to a venous plethora in the head, and it has accordingly been often followed by apoplexy, palsy, &c. When it happens in febrile diseases, and is in pretty large quantity, it may be generally considered as critical and salutary; but if these exanthemata be accompanied with any putrid disposition, this hæmorrhagy, as well as artificial blood-lettings, may have a very bad tendency.

The treatment in cases of epistaxis may be referred to two heads: 1*st*, the treatment during the time of the discharge; and 2*dly*, the treatment after the discharge is stopped, with the view of preventing the return of it. During the former of these

periods, it is necessary, in the first place, to consider whether the discharge should be left to its natural course, or stopped by artificial means. In determining this question, regard must be paid to the quantity of the discharge, the appearance of the blood, the constitution in which epistaxis occurs, the former habit of the patient, and the consequences which result from the discharge. When, from due consideration of these circumstances, there is reason to fear that further evacuation would be attended with bad consequences, though this disease has been generally thought very slight, it should seldom be left to the conduct of nature; and in all cases it should be moderated by keeping the patient in cool air, by giving cold drink, by keeping the body and head erect, by avoiding any blowing of the nose, speaking, or other irritation; and if the blood has flowed for some time, without showing any tendency to stop, we are to attempt the suppression of the hæmorrhagy, by pressing the nostril from which the blood flows; plugging it with lint, dipped in vinegar or a solution of alum, vitriolated zinc, or vitriolated iron; washing the face with cold water, or applying cold to some other parts of the body. These measures Dr. Cullen judges to be proper even on the first attacks, and in young persons, where the disease is the least hazardous: but they will still be more requisite if the disease frequently recurs without any external violence; if the returns happen to persons disposed to a plethoric habit; and more particularly if the signs of plethora appear in the symptoms preceding the discharge.

When the bleeding is so profuse that the pulse becomes weak and the face pale, every means must be used to put a stop to it, whether the patient be young or old. Besides those methods above mentioned, we must use astringents both internal and external; but the latter are the most powerful, and the choice of these may be left to the surgeon. The internal astringents are indeed immediately suited to internal bleedings, from the œsophagus, stomach, primæ viæ, &c. in cases where there is great weakness of the vessels and constitutional debility. They are either vegetable or fossil; but the vegetable astringents are seldom powerful in the cure of any hæmorrhagies except those of the alimentary canal. The fossil astringents are more active, but differ considerably in strength from one another. The preparations of lead in this view are powerful; but cannot be employed on account of their pernicious qualities, unless in cases of the utmost danger. The common white lead, in the dose of four or five grains, has been successfully given in hæmorrhagies of the alimentary canal; but besides the deleterious qualities of this mineral, it is undeserving of a preference over chalybeates, which are not only void of injury to the patient's constitution, but are far more powerfully astringent. The *tinctura ferri muriati* may be given in doses of ten to twenty drops, or more, and repeated every hour till the bleeding ceases; but this only in cases where it may be expected to reach the bleeding vessel, and act as a topic; for otherwise it may quicken the circulation, and do harm. Another safe, and at the same time powerful, astringent is alum, which Dr. Saunders administers in the following way:

℞ Alumin. in pulv. trit. gr. x.
Cons. rosæ rub. ℈j.
Fiat Bolus bis terve indies sumendus.

The vegetable astringents the Doctor recommends in hæmorrhagies of the primæ viæ are the following:

℞ Catechu in pulv. trit. ℈j.
Confect. opiat. gr. x.
Confect. aromat. q. s.
Fiat Bolus bis terve in die sumendus.

℞ Mist. cretac. ℥vi.
Tinct. catech. vel
Tinct. kino ℥ss.
Confect. opiat. ʒjss. Misce.
Dosis cochlearia duo vel tria, concusso prius vitro.

℞ Elect. catecu (Pharm. Edin.) q. pl.
Dosis a scrupulos quinque.

Where access can be had to the mouth of the bleeding vessel, the *Alum Lotion* of St. Bartholomew's Hospital, applied on lint, may suffice.

℞ Aluminis in pulv. trit. ʒij.
Aquæ distillatæ ℥viij.
Misce fiat Lotio.

If the alum be dissolved in vinegar, or verjuice, it will be still more effectual as a styptic.

For suppressing this and some other hæmorrhagies, many superstitious remedies and charms have been used, and said to have been employed with success. This has probably been owing to the mistake of the by-standers, who have supposed that the spontaneous cessation of the hæmorrhagy was owing to their silly remedy. At the same time, Dr. Cullen is of opinion, that such means have been accidentally useful, by impressing the mind with horror or dread. Opiates have sometimes proved successful in removing hæmorrhagies; and when the fulness and inflammatory diathesis of the system have been previously taken off by bleeding, they may, in Dr. Cullen's opinion, be used with safety and advantage. Ligatures have been applied upon the limbs, for retarding the return of the venous blood from the extremities; but their use seems to be ambiguous. In the case of profuse hæmorrhagies, no care is to be taken to prevent the patient from fainting, as this is often the most certain means of

stopping them; nor should cordials or volatile remedies be used to restore the patient, as they quicken the impetus of the blood, and thus augment the hæmorrhagy.

EPISTHO'TONOS, (επισθοτονος, from επισθω, *forwards*, and τεινω, *to extend)*; a spasmodic affection of muscles drawing the body forwards. See TETANUS.

EPISTROPHE'US, (επιστροφαιος, from επιστροφαω, *to turn round*, because the head is turned upon it); the second cervical vertebra. See DENTATUS.

EPITHE'LIUM, the cuticle on the red part of the lips; or that which is reflected upon the internal parts, as the mouth, rectum, &c.

EPITHE'MA, (επιθημα, from επι, *upon*, and τιθημι, *to apply)*; a term in pharmacy, sometimes applied to a lotion, fomentation, or some external application of a fluid kind.

EPITHY'MUM, (επιθυμον, from επι, *upon*, and θυμος, *the herb thyme)*, *cuscuta*; DODDER OF THYME. It is a parasitical plant, possessing a strong disagreeable smell, and a pungent taste very durable in the mouth. Two kinds are recommended, in melancholia, as cathartics, viz. *Cuscuta epithymum; foliis sessilibus, quinquifidis, bracteis obvallatis*, and *cuscuta europæa; floribus sessilibus*, Linn.

EPSOM SALT, a purging salt, formerly obtained by boiling down the mineral water found in the vicinity of Epsom, in Surrey. It is at present prepared from sea-water, which, after being boiled down, deposits an uncrystallized brine, that consists chiefly of muriated magnesia, and is sold in the shops under the name of *sal cath. amar.* bitter purging salt. It is of considerable service in colic, scurvy, and other complaints, usually treated with saline purgatives; and though more nauseous to the palate, its operation is milder and more effectual than that of the salts usually preferred to it.

EPSOM WATER, a mineral spring at Epsom, in Surrey. This water, evaporated to dryness, leaves a residuum, the quantity of which has been estimated from an ounce and a half, to five drachms and one scruple in the gallon. Of the total residuum, about four or five sixths is sulphate of magnesia mixed with a very few muriats, such as that of lime, and probably magnesia, which render it very deliquescent, and increase the bitterness, till purified by repeated chrystallizations. There is nothing sulphureous or metallic found in this spring.

Epsom water is transparent and colourless, at first almost insipid, but a short time after it has been drank it leaves a bitter saline taste on the tongue. It does not suffer any material alteration by being exposed to the air; and, if closely corked in clean vessels, it may be preserved for several months in a fresh and potable state. As this water contains only a small portion of the salt, namely, from one to two scruples in the quantity of half a pint, the patient ought to drink from two to three pints successively, within a short space of time, in order to produce the full purgative effect. If taken in this dose, it will operate in a mild and efficacious manner, but if in a smaller, its action is determined to the kidneys. Dr. Willich says, Epsom water is of considerable service in a variety of disorders, namely, hypochondriasis, an impaired state of health accompanied with œdematous tumors in the extremities, and a depraved digestion; to which sedentary persons are peculiarly liable. Those who are afflicted with hæmorrhoidal and scorbutic complaints, will be benefited by the liberal use of this saline water, which likewise affords considerable relief in obstructions of the viscera.

There are many other of the simple saline springs that might be enumerated, all of which agree with that of Epsom, in containing more or less of some purging salt. This, for the most part, is either Epsom or Glauber's salt, or often a mixture of both, such as Acton, Kilburne, Bagnigge Wells, the Dock and Duck in St. George's Fields, &c.

E'PULIS, (επυλις, from επι and υλα, *the gums)*; an excrescence growing from the gums.

EPULO'TICA, (επυλοτικα, from επυλοω, *to cicatrize)*, *epulotics*; a term given by surgeons to those applications which promote the formation of skin. We had formerly a *ceratum epuloticum*.

EQUISE'TUM, (from *equus*, a horse, and *seta*, a bristle, so named from its resemblance to a horse's tail), *cauda equina*; HORSE-TAIL, or mare's tail. The plant directed for medicinal purposes under this name is the *hippuris vulgaris*, Linn. It possesses astringent qualities, and an infusion of it is used by some people in diarrhœas and hæmorrhages. The same virtues are also attributed to the *Equisetum arvense, fluviatile limosum*, and other species, which are directed indiscriminately by the term *Equisetum*, in foreign dispensatories.

EQUISETUM ARVE'NSE. See EQUISETUM.

E'QUUS ASINUS; the systematic name of the animal called an ass. The female affords a light and nutritious milk. See MILK.

ERASI'STRATUS, a celebrated physician, grandson to the philosopher Aristotle. He discovered, by the motion of the pulse, the love which Antiochus had conceived for his mother-in-law Stratonice; and was rewarded with 100 talents for the cure, by the father of Antiochus. He was a great enemy to bleeding and violent physic, but approved of clysters. He was of opinion, however, that these should be mild; and condemned the large quantity and acrid quality of those used by the ancients. The reason why purgatives were mot much used by him was, that he imagined purging and venesection could answer no other purpose

than diminishing the fulness of the vessels; and for this purpose he asserted that there were more effectual means than either phlebotomy or purging. He asserted that the humours discharged by cathartics were no tthe same, in the body, that they appeared after the discharge; but that the medicines changed their nature, and produced a kind of corruption in them. This opinion has since been embraced by a great number of physicians. He did not believe that purgatives acted by attraction; but substituted, in the place of this principle, what M. Le Clerc imagines to be the same with Aristotle's *fuga vacui.* The principal remedy, substituted by him in place of purging and venesection, was abstinence. When this, in conjunction with clysters and vomits, was not sufficient to eradicate the disease, he then had recourse to exercise. All this was done with a view to diminish the plenitude, which, according to him, was the most frequent cause of all diseases. Erasistratus had a great opinion of the virtues of *succory*, in diseases of the viscera, especially of the liver. He employed some topical remedies, such as cataplasms, fomentations, and unctions. In short, as he could neither endure compounded medicines nor superstitious and finespun reasonings, he reduced medicine to a very simple and compendious art.

In his operations, Erasistratus appears to have been very bold; and, as an anatomist, cruel; having, it is said, dissected criminals while yet alive. In tumors of the liver, he made an incision through the skin and integuments, and having opened the abdomen, applied medicines immediately to the part affected. Yet he did not approve of tapping in the dropsy; "because (said he) the waters being evacuated, the liver, which is inflamed and become hard like a stone, is more pressed by the adjacent parts which the waters kept at a distance from it, so that by this means the patient dies." He declared also against drawing teeth which were not loose; and used to tell those who talked with him on this operation, that, in the temple of Apollo, there was to be seen an instrument of lead for drawing teeth; intending to insinuate, that we must not attempt the extirpation of any, but such as are loose, and call for no great force for their extirpation.

ERE'CTOR CLITO'RIDIS, the first muscle of the clitoris of Douglas. It is a muscle of the clitoris that draws it downwards and backwards, and serves to make the body of the clitoris more tense, by squeezing the blood into it from its crus. It arises from the tuberosity of the ischium, and is inserted into the clitoris.

ERE'CTOR PE'NIS; a muscle of the penis that projects the urine or semen forwards, and by grasping the bulb of the urethra, pushes the blood towards the corpus cavernosum and the glans, and thus distends them. It arises from the tuberosity of the ischium, and is inserted into the sides of the corpora cavernosa of the penis.

ERETHI'SMUS, (ερεθισμος, from ερεθιζω, *to excite* or *irritate)*, a term denoting increased sensibility and irritability. It is variously applied by modern writers.

E'RGOT, a name by which the French call rye that is diseased in a particular manner, from its grains assuming somewhat of the form of a cock's spur.

ERI'GERON A'CRE; the systematic name of the conyza. See CONYZA CÆRULEA.

ERI'GERUM, (εριγερων, from ηρ, *the spring*, and γερων, *old*, so called, because, in the spring, it has a white blossom like the hair of an old man), or *erigeron;* GROUNDSEL. This very common plant, the *Senecio vulgaris*, Linn. is frequently applied, bruised, to inflammations and ulcers, by the common people.

ERRA'TICUS, (from *erro*, to wander), erratic, or wandering; a term applied to irregular pains, occasioned by any disease which is not fixed, but moves from one part to another, as the gout, rheumatism, &c.

ERRHI'NA, (ερρινα, from εν, *in*, and ριν, *the nose)*, ERRHINES; those medicines which procure a discharge from the nose, sometimes of a mucous, and sometimes of a watery fluid; but which in both cases seems to proceed from the mucous follicles of the Schneiderian membrane upon the internal surface of the nose, and of the cavities adjoining to it. This evacuation occurs sometimes without any sneezing, though it is frequently attended with it. This however implies no difference, but merely that of stronger or weaker stimulus in the medicine employed. The sneezing that occurs may have particular effects by the concussion it occasions; but it does not vary the evacuation induced by the medicine, except that, with sneezing, there is commonly a larger evacuation produced from the glands. By these remedies we not only can restore the natural evacuation when it has been interrupted; but their effects commonly go further, and the evacuation is increased beyond its usual quantity, not only soon after the medicine has been applied, but also for some following days. As this must also produce an afflux of fluids from the neighbouring vessels, it often relieves rheumatic congestions in the neighbouring muscles, and particularly those in which the toothach consists.

But not only the more nearly adjoining muscles are thus relieved, but the effects may extend further to the whole of the branches of the external carotid; and Dr. Cullen says he has known instances of head-ach, pains of the ear, and ophthalmias, cured or relieved by the use of errhines. How far, he says, their effects may extend, cannot easily be determined; but it is probable that they may

operate more or less on the whole vascular system of the head, as a branch of the internal carotid passes even into the nose: and independent of this, it is not improbable, that our errhines may have been of use in preventing apoplexy and palsy; which at least is to be attended to so far, that whenever any attack of these diseases is suspected, the drying up of the mucous discharge should, if possible, be prevented.

Errhines differ only by the degree of acrimony they possess; and Dr. Cullen arranges them accordingly. His list includes *beta*, *betonica*, *marjorana*, *asarum*, *nicotiana*, and *euphorbium*. (See those articles).

E'RROR LOCI, a term introduced into medicine by the celebrated Boerhaave, who is said to have entertained an opinion that the vessels were of different sizes, for the circulation of blood, lymph, and serum; and that when the larger sized globules were forced into the lesser vessels by an *error of place*, these last were *obstructed*. But this opinion does not appear to be well grounded, and is accordingly exploded from our modern systems.

ERU'CA, (from *erugo*, to make smooth, so named from the smoothness of its leaves; or from *uro*, to burn, because of its biting quality); common garden rocket, Roman rocket, or rocket gentle. *Brassica eruca*; *foliis lyartis*, *caule hirsuto siliquis glabris*, Linn. The seeds of this and of the wild rocket, have an acrid taste, and are eaten by the Italians in their pickles, &c. They are said to be aperient and antiscorbutic, but are chiefly esteemed for their supposed aphrodisiac qualities.

ERU'CA SYLVE'STRIS, the wild rocket; *brassica erucastrum*, Linn. See Eruca.

E'RVUM, (*quasi arvum*, a field, because it grows wild in the fields: or from *eruo*, to pluck out, because it is diligently plucked from corn), or *orobus*; the TARE. The plant ordered in some foreign pharmacopœias by this name, is the *Ervum ervilia; germinibus undato-plicatis, foliis imparipinnatis*, Linn. In times of scarcity these have been made into bread, which is not the most salubrious. The meal was formerly included amongst the resolvent remedies, by way of poultice.

E'RVUM ERUI'LIA; the systematic name of the *Orobus*. See Ervum.

E'RVUM LENS; the systematic name of the lentil. See Lens.

ERY'NGIUM, (ερυγγιον, from ερυγγανω, *to eructate*, because it causes eructation), sea-eryngo, or HOLLY; the *Eryngium maritimum; foliis radicalibus subrotundis plicatis spinosis, capitulis pedunculatis, paleis tricuspidatis*, Linn. Class, *Pentandria*. Order, *Digynia*. The root of this plant is directed for medicinal purposes. It has no particular smell, but to the taste it manifests a grateful sweetness; and, on being chewed for some time, it discovers a light aromatic warmth or pungency. It was formerly celebrated for its supposed aphrodisiac powers, and candied with loaf sugar, but it is now very rarely employed in any form.

ERY'NGIUM CAMPE'STRE; the *Eryngium campestre; foliis radicalibus, amplexicaulibus, pinnato-lanceolatis*, Linn. The root is used, in many places, for that of the sea-eryngo. See Eryngium.

ERY'NGO. See Eryngium.

ERY'NGO, SEA. See Eryngium.

ERY'NGO-LEAVED LI'CHEN. See Lichen islandicus.

ERY'SIMUM, (ερυσιμον, from ερυω, *to draw*, so called from its power of drawing and producing blisters; others derive it απο τȣ ερεικειν, because the leaves are much cut; others from εριτιμον, *precious*), HEDGE-MUSTARD; *Erysimum officinale; siliquis spicæ adpressis, foliis runcinatis*, Linn. This was formerly much used for its expectorant and diuretic qualities, which, however, are now forgotten. The seeds are warm and pungent, and very similar to those of common mustard in their sensible effects.

ERY'SIMUM ALLIA'RIA; the systematic name of jack-in-the-hedge. See Alliaria.

ERY'SIMUM BARBAREA; the systematic name of the *barbarea* of the shops. See Barbarea.

ERY'SIMUM OFFICINA'LE; the systematic name of the hedge-mustard. See Erysimum.

ERYSI'PELAS, (ερυσιπελας, from ερυω, *to draw*, and πελας, *adjoining*; named from the neighbouring parts being affected by the eruption), formerly called *Ignis sacer*, and popularly, St. Anthony's fire; a genus of disease in the class *pyrexiæ*, and order *exanthemata*, of Cullen. There are two species of this disease, according to him: 1. *Erysipelas vesiculosum*, with large blisters: 2. *Erysipelas phlyctænodes*, the shingles, or an erysipelas with phlyctenæ, or small blisters.

The erysipelas of the face, where this affection very frequently appears, comes on with a cold shivering, and other symptoms of pyrexia. The hot stage of this is frequently attended with a confusion of the head, and some degree of delirium; and almost always with drowsiness, and perhaps coma. The pulse is always frequent, and commonly full and hard. When these symptoms have continued for one, two, or at most for three days, an *erythema* appears on some part of the face. This at first is of no great extent; but gradually spreads from the part it first occupied to the other parts of the face, till it has affected the whole; and frequently from the face it spreads over the hairy scalp, or descends on some part of the cheek. As the redness spreads, it commonly leaves, or at least is abated in, the parts it had before occupied. All the parts which the redness affects are also affected with some swelling, which continues for

some time after the redness has abated. The whole face becomes considcrably turgid; and the eye-lids are often so much swelled as entirely to shut up the eyes. When the redness and swelling have continued for some time, there commonly arise, sooner or later, blisters, of a larger or smaller size, on several parts of the face. These contain a thin colourless liquor, which sooner or later runs out. The surface of the skin in the blistered places sometimes becomes livid and blackish; but this seldom goes deeper, or discovers any degree of gangrene affecting the skin. On the parts of the face not affected with blisters, the cuticle suffers, towards the end of the disease, a considerable desquamation. Sometimes the tumor of the eye-lids ends in a suppuration.

The inflammation coming upon the face does not produce any remission of the fever which had before prevailed; nay, sometimes the fever encreases with the spreading and increasing inflammation. The inflammation commonly continues for eight or ten days; and, for the same time, the fever and symptoms attending it also continue. In the progress of the disease, the delirium and coma attending it sometimes go on increasing, and the patient dies apoplectic on the seventh, ninth, or eleventh day of the disease. In such cases it has been commonly supposed, that the disease is translated from the external to the internal parts. But Dr. Cullen thinks, that the affection of the brain is merely a communication from the external affection, as this continues increasing at the same time with the internal. When the fatal event does not take place, the inflammation, after having affected the whole face, and perhaps the other external parts of the head, ceases, and with that the fever also; and, without any other crisis, the patient returns to his ordinary health. This disease is not commonly contagious; but as it may arise from an acrid matter externally applied; so it is possible, that the disease may sometimes be communicated from one person to another. Persons who have once laboured under erysipelas are liable to returns of it.

The event of this disease may be foreseen from the state of the symptoms which denote more or less the affection of the brain. If neither delirium nor coma come on, the erysipelas is seldom attended with any danger; but when these symptoms appear early in the disease, and are in a considerable degree, the utmost danger is to be apprehended.

The erysipelas of the face is to be cured, according to the opinion of some practitioners, much in the same manner as phlegmonic inflammation; by blood-letting, cooling purgatives, and by employing every part of the antiphlogistic regimen. See Erythema. Many observations, however, would lead us to conclude, that, in not a few cases, the concomitant fever has here a tendency to the typhoid type; and therefore evacuations, apparently serviceable in the first instance, have afterwards a bad effect. The evacuations of blood-letting and purging are to be employed more or less according to the urgency of symptoms; particularly those which mark an affection of the brain. As the pyrexia continues, and often increases with the inflammation of the face, so the evacuations above mentioned are to be employed at any time of the disease. When, however, the fever, in place of marks of the phlogistic diathesis, particularly a full, hard, and strong pulse, is attended with symptoms of great debility, and with a small pulse easily compressible, evacuations, particularly under the form of blood-letting, must be used with very great caution. Even in such cases, however, the use of refrigerant cathartics may still be persisted in with more safety and greater advantage. But whether evacuations have been employed or not, when symptoms of debility run to a great height, and marks of a putrescent tendency appear, recourse must be had to wine and the Peruvian bark. In cases which, at the commencement, require evacuation, these are often, in the after periods, employed with very great benefit.

In this, as in other diseases of the head, when that part happens to be the seat of erysipelas, it is proper to put the patient, as often as he can easily bear it, into somewhat of an erect posture: and as, in this disease, there is always an external affection, so, various external applications have been proposed to be made to the part affected; but almost all of them are of doubtful effect.

An erysipelas frequently appears on other parts of the body besides the face, and such other erysipelatous inflammations frequently end in suppuration; but these cases are seldom dangerous. At coming on, they are sometimes attended with drowsiness, and even with some delirium; but this seldom happens, and these symptoms do not continue after the inflammation is formed. Dr. Cullen does not remember to have seen an instance of the translation of an inflammation from the limbs to an internal part: and though these inflammations of the limbs be attended with pyrexia, they seldom require the same evacuations as the erysipelas of the face.

It is to be observed, however, that the erysipelas in London, will less admit of an antiphlogistic treatment, than that which usually occurs in Scotland: and this difference is perhaps to be accounted for merely on the ground of diseases of debility being always more prevalent there than in Edinburgh.

Professor Hufeland has published some observations on the *erysipelas of new-born children;* a disease which, on account of its rarity, is not sufficiently known to practitioners. Very little is said on this subject, indeed, in medical books. The first who describes it is Mr. Bromfield, in the Med. Com. It is likewise mentioned by Girtanner;

and fully by Professor Osiander, of Gottingen, in his Mem. of Physic and Midwifery.

"The disease appears in the first days of life to the sixth week, and there are a few cases of children being born with it. Sometimes it is preceded by locked jaw and jaundice. At a single place, or on several at once, particularly on the lower extremities, regio inguinis, the neck, &c. red spots appear; which being at first but little raised on the skin, extend themselves afterwards, whereby the parts begin to swell, and become hard and painful. On pressing the swelling with the finger, the spot where the finger is applied becomes white, but without leaving a dimple. The colour of the tumor is changed, and becomes dark red and blue; gangrenous blisters and petechiæ appear; the joints affected by the disease become stiff, the belly tense, and locked jaw and jaundice sometimes supervene a little before death comes on. The disease seems, in some cases, to originate from the epidemical constitution, at least Professor Osiander observed it at the time when many lying-in women were affected by bilious and rheumatic fevers. Girtanner says, it is less dangerous when the erysipelas is confined to single places, and when it begins to suppurate, but when it extends itself, and first appears on the belly and genitals, or when gangrene supervenes, the event is mostly fatal. Bromfield, nevertheless, succeeded in saving a child under these circumstances. It proves certainly mortal, however, when the intestines are affected, or trismus comes on. The disease lasts from twenty-four hours to a fortnight, and longer.

In the method of cure which Professor Hufeland employed, though on the whole with little avail, recourse was had to evacuating the intestinal canal by vomits, mild purgatives, and clysters. Zinc. calc. and opium were administered, and frictions with oil and opium were applied on the belly and region of the liver. To promote a diaphoresis, antimonials and aq. amm. acet. were exhibited, and their operation promoted by warm baths; and at the transition of the inflammation to gangrene, the Peruvian bark, camphor, &c. were administered. The application of preparations of lead, by repelling the eruption, are likely to occasion a dangerous metastasis towards the intestines. Neither is it adviseable to make use of the bark and camphor, while the disease is in the inflammatory stage; though, according to Bromfield, it may be of great service, when the erysipelas threatens to become gangrenous. It seems, according to what Hufeland has observed, that on the whole, baths of warm milk, in combination with gentle diaphoretics and antispasmodics, as valerian, zinc. calc. and in some cases musk, are the best remedies for curing this dangerous infantile disease.

Dr. Wells, a physician of London, has endeavoured to prove, that, in some instances, the erysipelas is *contagious*. This opinion is also supported in a paper, inserted in the Medical and Physical Journal, by Dr. Stokes of Chesterfield. Dr. Cullen, it seems, had noticed it himself—"This disease," says the Professor, "is *not commonly contagious*; but as the disease *may* arise from an *acrid matter externally applied*, so it is possible that the disease may sometimes be communicated from one person to another. The sting of a bee, or wasp, I have seen produce all the effects of erysipelas of the face; and it is probable, that acrimony may be communicated from one person to another. An hospital physician, of sufficiently just information, also says, that they have had instances of the contagious nature of erysipelas, several persons being affected in the same room or ward. That it has been so communicated is a fact; but I have a hundred negative instances, in which only one in a family has been affected, though there was a free communication between the patient and the other branches of the family." See INFLAMMATION.

ERYTHE'MA, (ερυθημα, from ερυθρος, *red*); a morbid redness of the skin. The word *erythema* does not apply to any primary disease, but to a great number of those cutaneous inflammations denominated by another term, viz. the *erysipelas*, or popularly, *St. Anthony's fire*; and which, being commonly symptomatic of some other inflammation or disorder, are to be removed only by removing the primary disease. The erythema is found scarcely to bear any kind of warm application to itself; and is very apt, if treated as a primary disease, to terminate in a gangrene of the part affected, or some other disorder still more dangerous. The difference between the *phlegmon* and *erythema*, according to Dr. Cullen, is, that, in the former, the inflammation seems particularly to affect *the vessels on the internal surface of the skin* communicating with the lax adjacent cellular texture; whence a more copious effusion, and that too of serum convertible into pus, takes place. In the erythema, the affection is of the vessels on the external surface of the skin communicating with the *rete mucosum*, which does not admit of any effusion but what separates the cuticle and gives occasion to the formation of a blister, while the smaller size of the vessels admits only of the effusion of a thin fluid very seldom convertible into pus. The cure of the fever attended with *erythema*, is spoken of under ERYSIPELAS. With regard to the external treatment little can be said, as the cases occur very seldom in which we should be justified in using any topical remedies whatever. Where the disease is situated on the head or face, cold or astringent applications are extremely dangerous and liable to occasion a phrenitis. If any thing is to be attempted, it is to assuage the burning heat of the skin, by letting the patient hold his face over a vessel of hot water into which some camphor is thrown, so that the steam may be

felt; or, in case of a troublesome effusion of lymph from the skin, we may absorb it by applying occasionally a little starch powder.

Some have preferred bathing the part with aqua ammoniæ acetatæ alone. But in any case, these applications should be previously warmed, in a tea-cup placed in hot water; and the part should be covered immediately after their use. Greasy applications are to be wholly interdicted in all cases of this disease.

ERYTRO'DANUM, (ερυθροδανον, from ερυθρος, *red*, so called from the colour of its juice). See Rubia.

E'SCHAR, (εσχαρα, from εσχαραω, *to scab over)*; the portion of flesh that is destroyed by the application of a caustic. It generally assumes a black and shrivelled appearance.

ESCHARO'TICA, (of the Greek εσχαρωτικα, from εσχαραω, *to scab over)*, *escharotics*, caustics, or corrosives. This term is given, by surgeons, to those substances which possess a power of destroying the texture of the various solid parts of the living body to which they are directly applied. The operation of caustics, whilst any living principle subsists in the part to which they are applied, is always attended with pain, and may thereby prove a considerable irritation to the whole system; but this is an effect which they possess with many other stimulants. The same thing may be said of their use in exciting a discharge of pus from a wound, when they are employed sparingly, and with that particular view; as when *hydr. nitrat. rub.* is lightly sprinkled on a sore, or else incorporated with some digestive ointment, previous to its application.

The particular corrosives, used for the purposes of practice, are very generally known. As solvents of animal matter, we may mention, in the first place, the acids which are obtained in a very concentrated state, such as the vitriolic and nitrous; these, therefore, may be employed as caustics. Their fluidity, however, makes it difficult to confine their application to the parts which are only to be acted upon, and therefore it is that they are seldom employed. The caustic most generally employed is the *kali purum*, formerly named *lapis infernalis*, or potential cautery. How it is to be managed as a caustic, is a matter very well known. Dr. Edward Barry, in the Edinburgh Medical Essays, has proposed the employment of a caustic of acid and alkali *alternately applied.* Dr. Cullen allows that the idea is specious, but on trial it did not succeed with him; and he supposes it will not at all answer, except where large masses of living substance are to be consumed, and where the spreading of the acid can do no harm.

The caustic qualities of acids, though entirely destroyed by their being combined with alkalies and earths, are not so by their being combined with metals. On the contrary, the nitrous acid, combined with silver, gives the *argent. nitrat.* or lunar caustic a remedy very commonly employed; and the muriatic acid, in a concentrated state, joined with antimony, gives the *antim. muriat.* or what was formerly called *butter of antimony*, which is one of the strongest caustics known. Some of these metallic escharotics are attended with the same inconvenience as the simple acids; that is, they are disposed to *spread* beyond the bounds intended for them: this, however, is more easily managed with respect to the argent. nitrat. which can be got in a solid form, than with respect to the antimonial caustic, which is necessarily liquid; and hence the latter is more rarely employed by surgeons.

These corrosive matters, as has been observed, are of different degrees of strength; and act often in proportion to the quantity applied. When they are not sufficient to dissolve the more solid parts, they still may dissolve those more tender fungous excrescences which arise in ulcers. Thus it happens, that *alum*, having a considerable portion of its watery parts exhaled, and its acid thereby concentrated, is rendered capable of consuming the fungous growth in ulcers. It is, however, always a weak escharotic; and we have a stronger kind in the preparations of mercury and copper. Both these preparations are noted for their cleaning foul sores, and bringing them to discharge a proper pus, so necessary to their healing; all which is to be ascribed to their escharotic power under proper management.

A *specific* power, in certain cases, has been supposed to reside in the mercurial escharotics; but this cannot be supposed in the preparations of copper, which, however, often answer the purpose as well. In practice, the force of the latter cannot be so well measured or limited, as the former; and therefore the dry hydrarg. nitr. rub. or red precipitate, as being little liable to spread, is found the most convenient application. Mixing this with unctuous matters, very much diminishes its power, and this is found necessary sometimes in the treatment of ulcers.

Some persons make a distinction between *caustics* and *escharotics*, and this they found only on the degree of action expected from either; but there is no good foundation for this. See the different substances named above.

ESCULENT; an epithet given to such plants, or any part of them, that may be eaten for food. Thus carrots, turnips, cabbage, &c. are *esculent vegetables.*

E'SOX LU'CIUS; the systematic name of the fish of the class *pisces*, and order *abdominales*, from whose liver an oil spontaneously is separated, which is termed in some pharmacopœias *oleum lucii piscis.* It is used, in some countries, to destroy spots of the transparent cornea, and also to anoint the skin in rheumatism.

ESSENCE, is strictly that which constitutes the nature of any thing, and makes it be what it is; but in pharmacy it is used to signify the concentrated properties, or virtues, of any simple substance or composition.

ESSENTIAL OIL. See OIL.

E'SSERA, (ESSERA, Arab.); a species of cutaneous eruption, distinguished by broad, shining, smooth, red spots, mostly without fever, and differing from the nettle rash only in not being elevated. It generally attacks the face, hands, and wrists.

E'SULA, (from *esus*, eating, because it is eaten by some as a medicine); SPURGE.

E'SULA MAJOR. The officinal plant ordered by this name in some pharmacopœias is the *Euphorbia palustris; umbella multifida, bifida, involucellis ovatis foliis lanceolatis, ramis sterilibus*, Linn. The juice of this plant is exhibited in Russia as a common purge; and the plant itself is given, in some places, in the cure of intermittents.

E'SULA MINOR, the *tithymalis cyparissus:* cypress spurge. This, like most of the spurges, is very acrimonious, inflaming the eyes and œsophagus after touching them. It is now fallen into disuse, whatever were its virtues formerly, which, no doubt, amongst some others, was that of a laxative. Amongst the vulgar, it is called *poor-man's rhubarb.*

ETHER. See ÆTHER.

ETHER, ACETOUS; an etherial fluid, drawn over from an equal mixture of alcohol and acetous acid, distilled with a gentle heat from a glass retort in a sand bath. It has a grateful smell, and is extremely light, volatile, and inflammable.

ETHER, MURIATIC. This is obtained by first mixing, and then distilling, alcohol, with extremely concentrated muriat of tin. It is stimulant, antiseptic, and diuretic in its effects, though little used in practice.

ETHERIAL OIL; a name given to any highly rectified essential oil.

ETHIOPS, ANTIMONIAL. See ÆTHIOPS.

ETHIOPS MINERAL. See HYDRARGYRUS CUM SULPHURE.

ETHIOPS PER SE. See OXYDUM HYDRARGYRI NIGRUM.

ETHIOPS MARTIALIS. See ÆTHIOPS.

ETHMOID BONE, (from ηθμος, *cribrum* a sieve, and ειδος, *forma*, shape), the sieve-like bone. It is situated in the middle of the basis of the os frontis. It is perforated by a number of small holes, through which the fibres of the olfactory nerves pass; and hence it has this name. It is joined to the os frontis and sphenoides by the sutura ethmoidalis. In its middle it has a small process called *crista galli*, to which the fore end of the falx is tied. From its under side, there goes a thin bone, which divides the cavity of the nostrils in two; the lower end of which is grooved with the vomer. On each side of this partition it has several small spongious laminæ, called *ossa spongiosa*, which are full of little cells, at their juncture with the ethmoides. The two external laminæ of the ossa spongiosa, make part of the orbit at the great canthus; and they are called *plana*, because they are smooth and even.

ETHMOI'DES, OS. See ETHMOID BONE.

EUDIOMETER; an instrument by which the quantity of oxygen and azot in atmospherical air can be ascertained. See ATMOSPHERE. These are variously constructed, but all founded upon the principle of decomposing common air, by means of a body which has a greater affinity with the oxygen.

EUGE'NIA JAMBOS; the systematic name of the Malabar plum-tree. See MALABAR PLUM.

EUPATO'RIUM, (ευπατοριον, from *Eupator*, its inventor), also called *Eupatorium Arabicum*, HEMP AGRIMONY, a very bitter and strong smelling plant. It is the *Eupatorium cannabinum; foliis digitatis*, Linn. Its juice proves violently emetic and purgative, if taken in sufficient quantity, and promotes the secretions very generally. It is recommended, in the foreign pharmacopœias, as a remedy in dropsies, jaundice, agues, &c. and is in common use in Holland, amongst the lower orders, as a purifier of the blood in old ulcers, scurvy, and anasarca.

EUPATO'RIUM ARA'BICUM. See EUPATORIUM.

EUPATO'RIUM CANNABI'NUM; the systematic name of hemp agrimony. See EUPATORIUM.

EUPATO'RIUM ME'SUES. See AGERATUM.

EUPE'PTICA, (ευπεπτικα, from ευ, *good*, and πεπτω, *to digest*), *eupeptics:* substances, are so called that are easy of solution in the stomach.

EUPHO'RBIA ANTIQUORUM; the Linnæan name of a plant supposed to yield the *Euphorbium.*

EUPHO'RBIA CANARIE'NSIS; a species of spurge in the Canary islands, which is said to afford the gum euphorbium.

EUPHO'RBIA CYPARI'SSIAS; the systematic name of the cypress spurge. See ESULA MINOR.

EUPHO'RBIA LATHY'RIS; the systematic name of the plant which affords the lesser cataputia seeds. See CATAPUTIA MINOR.

EUPHO'RBIA OFFICINA'RUM; the systematic name of the plant which yields euphorbium in the greatest abundance. See EUPHORBIUM.

EUPHO'RBIA PALU'STRIS; the systematic name of the greater spurge. See ESULA MAJOR.

EUPHO'RBIA PARA'LIAS. See TITHYMALUS PARALIOS.

EUPHO'RBIUM, (from *Euphorbus*, the physician of king Juba, in honour of whom it was so named); an inodorous gum-resin, in yellow tears, which have the appearance of being worm-eaten. This gum is said to be obtained from several species of *euphorbiæ*, but principally from the *Euphorbia officinarum; aculeata nuda multangularis, aculeis germinatis*, Linn. It is imported from Ethiopia,

Libya, and Mauritania. It contains an active drastic resin, but it is very seldom employed, except as an errhine.

EUPHRA'SIA, (corrupted from *Euphrosyne*, ευφροσυνη, from ευφρων, *joyful;* so called because it exhilerates the spirits), the herb EYE-BRIGHT; *euphrasia officinalis; foliis ovatis, lineatis, argute dentatis*, Linn. This little plant has been greatly in favour with the common people, as a remedy for all diseases of the eyes; yet it is now wholly fallen into disuse. It is an ingredient in the British herb tobacco.

EUPHRA'SIA OFFICINALIS; the systematic name of the eye-bright. See EUPHRASIA.

EUSTA'CHIAN TUBE; *tuba Eustachiana.* The tube so called was discovered by the great anatomist Eustachius. It begins from the anterior extremity of the tympanum, and runs forwards and inwards in a bony canal, which terminates with the petrous portion of the temporal bone. It then goes on, partly cartilaginous and partly membranous, gradually becoming larger, and at length ends behind the palatum molle. Through this tube the air passes to the tympanum, by which the impressions on the latter are counterbalanced. See EAR.

EUSTA'CHIAN VALVE. See VALVULA EUSTACHII.

EUSTA'CHIUS (Bartholomew), an eminent physician and anatomist at Rome, flourished about the year 1550. His anatomical plates were discovered there in 1712, and published in 1714. His memory is perpetuated in our days, by the name given to that canal which extends from the external ear to the fauces (see EUSTACHIAN TUBE), and of which he was the first discoverer.

EVACUATION, any diminution of the animal fluids, whether it be by cathartics, blood-letting, or any other means.

EVAPORATION; the volatilization of a fluid by means of heat, with access of air, in order to diminish its fluidity, to obtain any salts that it may hold in solution, or to diminish the quantity of a residuum. In this manner sea water is evaporated, and the salt obtained; decoctions also are made into extracts. The general rules for evaporating are, to place the matter in a flat, shallow, wide vessel, so that a large surface of the liquor may be presented to the air; for it is only from the surface that evaporation takes place. The degree of heat ought to be proportioned to the volatility of the substance to be evaporated, and to the degree of the fixity of the matter to be lost; thus the less fixed the matter to be left is, and the more strongly it adheres to the volatile parts, the less the degree of heat ought to be; and in such cases, too, a forcible current of air is sometimes scarcely admissible: on the contrary, when the matter to be evaporated is not very volatile, and the matter to be left is very fixed, and does not adhere strongly to the volatile part, the evaporation may be urged by a strong heat, aided by a current of air directed upon the surface of the liquor.

This process is applicable to the solutions of all those substances which are less volatile than the menstruum, or which will not exhale by the heat requisite for the evaporation of the fluid: as the solutions of fixt alkaline salts; of the gummy, gelatinous, and other inodorous parts of vegetables and animals in water; and of many resinous substances in alcohol.

EXANTHE'MATA, (εξανθημα, from εξανθεω, *to spring forth*, or *bud);* an eruption of the skin. Dr. Cullen makes *exanthemata* an order in the class *pyrexiæ.* It includes contagious diseases, beginning with fever, and followed by an eruption on the skin. See NOSOLOGY.

EXCIPIENT. In prescriptions, that is called *excipient* which receives the other ingredients, and gives them a proper form, as officinal electuaries, conserves, &c.

EXCITABILITY. See EXCITEMENT.

EXCITEMENT, a term lately introduced into medicine by Dr. Brown. Man and other animals, perhaps, differ from themselves in their dead state, or from any other inanimate matter, in this property alone; *they can be affected by external agents, as well, as by certain functions peculiar to themselves, in such a manner, that the phenomena peculiar to the living state can be produced.* This proposition extends to every thing that is vital in nature, and therefore applies to vegetables.

The external agents are reducible by heat, diet, and other substances taken into the stomach, blood, the fluids secreted from the body, and air. The functions of the system itself, producing the same effect, are muscular contraction, sense, or perception, and the energy of the brain in thinking, and in exciting passions and emotions. These affect the system in the same manner as the other agents; and they arise both from the other and from themselves.

If the property which distinguishes living from dead matter, or the operation of either of the two sets of powers be withdrawn, life ceases. Nothing else than the presence of these is necessary to life. The property on which both sets of powers act is named *excitability*, and the powers themselves exciting powers. The word *body*, according to Dr. Brown, means, both the body simply so called, and also as endued with an intellectual part, a part appropriated to passion and emotion, or a soul: the usual appellation that prevails in medical writings is system.

The effects, common to all the exciting powers, are sense, motion, mental exertion, and passion. Now their effects being the same, it must be granted, that the operation of all the powers is the same. The effects of the exciting powers acting upon the

excitability may be denominated *excitement.* For a more detailed account of this subject, see BRUNONIANISM.

EXCITING CAUSE, the same as occasional, procatarctic, or remote cause. It is that which, when applied to a body under a state of predisposition, excites a disease. The exciting or remote causes of diseases are either external or internal. See CAUSES.

EXCORIATION, (from *excorio*, to take off the skin); an abrasion of the cutis.

EXCREMENTS, (from *excerno*, to separate from); the stools or alvine fæces.

EXCRESCENCE, (from *excresco*, to grow from); a preternatural formation of flesh, or a tumor of any part of the body. Wens, warts, &c. are excrescences.

EXCRETION, (from *excerno*, to separate from); a term applied to the separation or secretion of those fluids from the blood of an animal, that are supposed to be useless, as the urine, perspiration, and alvine fæces.

EXO'CHAS, (*εξοχας*, from *εξω*, *without*, and *εχω*, *to have*); a tubercle on the outside of the anus.

EXO'MPHALOS, (*εξομφαλος*, from *εξ*, *out*, and *ομφαλος*, *the navel*); an umbilical hernia. See HERNIA.

EXOPHTHA'LMIA, (*εξοφθαλμια*, from *εξ*, *out*, and *οφθαλμος*, *the eye*); a swelling or outward protrusion of the bulb of the eye, to such a degree, that the eye-lids cannot cover it. This disease may be caused by inflammation, when it is termed *exophthalmia inflammatoria;* or from a collection of pus in the globe of the eye, when it is termed the *exophthalmia purulenta;* or, from a congestion of blood within the globe of the eye, *exophthalmia sanguinea.*

EXOSTO'SIS, (*εξοστωσις*, from *εξ*, and *οστεον*, *a bone*); also named *hyperostosis;* a morbid enlargement, or tumor of a bone. It is a genus of disease arranged, by Cullen, in the class *locales*, and order *tumores.*

EXPECTORANTS, (*expectorantia*, a word derived from *expectoro*, to discharge from the breast); an appellation given to those medicines which facilitate the bringing up the contents of the lungs.

Dr. Cullen says, the rendering the matters present in the bronchia more or less ready to be brought up, must depend upon the nature and state of them, which may be very various, according to the difference of the disease that has poured them out. For this reason he cannot give any general rule; indeed Dr. Cullen thinks that, in most cases, we can neither increase their quantity, nor otherwise change them, so as to render them fit for an easier evacuation by the mouth. The case most frequently occurring, and which we understand the best, is when the natural mucus that exudes from the follicles of the bronchia, is poured out in an unusually large quantity, and often in a more viscid state than can be easily detached from the cells of the bronchia. It is in this case especially that *expectorants* are required; and it is supposed that, by their use, the mucus may be brought up more largely, and with more facility. In what manner however they do this, it is difficult to explain. They may perhaps do it by merely exciting a cough; but we know of no internal medicines capable of doing this, but what excite vomiting at the same time. Diseases depending upon an accumulation of mucus in the lungs may, however, be often relieved by medicines which determine to the surface of the body. These last may diminish the determination of blood to the lungs, and consequently the quantity of mucus poured into the bronchia, may be so reduced, that the expectoration of what remains may become easy.

These means, however, do not properly reach the business of expectoration, the effectual means of expeding which, is by rendering the mucus *less viscid*, and upon this account more easily detached from the bronchia. Here, therefore, is occasion for the medicines named and supposed to be *attenuantia et incidentia;* but Dr. Cullen suspects, that the whole of the theory on this subject is mistaken: in general, he thinks, no such medicines do exist. He denies the existence of a mucus in the circulating mass of our fluids; and contends, that mucus never appears but in consequence of a stagnation in the mucous follicles. "Many phænomena show," says he, "that, whenever the secretion of the liquor to be changed into mucus is increased, it is poured out in a very liquid form; and therefore, from its appearance afterwards as mucus, there is no conclusion to be drawn that any such viscid fluid preexisted in the mass of blood. We hold it therefore for certain, that in the diseases depending upon an accumulation of mucus in the bronchia, there is no place for the operation of attenuants, as I believe that nobody will fancy they can operate upon the mucus already poured out into the bronchia."

The only explanation that Dr. Cullen can find probable is, "that by increasing the secretion of the liquid that is to afford a mucus, this, as poured from the arteries into the follicles, being always a thin fluid, may dilute the mucus in the follicles, and may make it to be poured out from these in a less viscid state, and may thereby render it more easy to be brought up by coughing, that is, to be more freely expectorated."

The means however of effecting this are not very obvious. We know no internal medicine that seems to increase the secretion of mucus from the Schneiderian membrane; yet experience seems to evince, that there are medicines that can quicken the secretion of the same from the bronchia. In the latter,

there is a constant and considerable exhalation of moisture; and there are many reasons for believing that this is an *excrementitious secretion*, connected with the other excrementitious secretions, particularly with the perspiration from the surface of the body. If therefore there are medicines disposed to cause perspiration, it may be presumed, that these are disposed to pass by the exhalation from the lungs. Medicines, therefore, which pass through the vessels of the lungs, may possibly operate upon the secretions made there, and particularly on that of the fluid to be changed into mucus. By this the mucus present in the follicles may be poured out in a less viscid form, and consequently in a state to be more fit for expectoration.

Amongst the *particular expectorants*, Dr. Cullen first sets down a number of the verticillated plants which have had some reputation as expectorants; though their powers have not at all been confirmed by his experience. The subjects are *Enula Campana*, *Iris Florentina*, *Tussilago*, *Petasites*, *Nicotiana*, and *Scilla*. See those articles.

EXPIRATION, (from *expiro*, to breathe); that part of respiration in which the air is driven out from the lungs. See RESPIRATION.

EXPRESSED OILS, a name given to such oils as are obtained by pressing the substance containing them, as olives, which give out olive oil, almonds, &c,

EXPRESSION, a term in pharmacy, signifying the operation of the *press* for forcing out the juices of succulent herbs and fruits; and the insipid oils of the unctuous seeds and kernels. The harder fruits, as quinces, require to be previously well beaten or ground; but herbs are to be only moderately bruised. The subject is then included in a hair bag, and pressed betwixt wooden plates, in the common screw-press, as long as any juice runs from it. The expression of oils is performed nearly in the same manner as that of juices; only, here, iron plates are substituted for the wooden ones there made use of. The subject is well pounded, and included in a strong canvass bag, betwixt which and the plates of the press, a hair-cloth is interposed. The insipid oils of all the unctuous seeds, are obtained, uninjured, by this operation, if performed without the use of heat; which, though it greatly promotes the extraction of the oil, at the same time impresses an ungrateful flavour, and increases its disposition to grow rancid. The oils expressed from aromatic substances generally carry with them a portion of their essential oil: hence the smell and flavour of the expressed oils of nutmegs and mace. They are very rarely found impregnated with any of the other qualities of the subject: oil of mustard-seed, for instance, is as soft and void of acrimony as that of almonds, the pungency of the mustard remaining entirely in the cake left after the expression.

EXSICCATION, in pharmacy, the drying of moist bodies, of which there are two general methods employed: in the one, their humid parts are exhaled by heat; in the other, they are imbibed or absorbed by substances, whose spongy texture adapts them to that use. Bodies intimately combined with, or dissolved in, a fluid, as recent vegetables and their juices, require the first; such as are only superficially mixed, as when earthy or indissoluble powders are ground with water, are commodiously separated from it by the second. Vegetables and their parts are usually exsiccated by the natural warmth of the air: the assistance of a gentle artificial heat may, nevertheless, in general, be not only safely, but advantageously had recourse to. By a moderate fire, even the more tender flowers may be dried, in a little time, without any considerable loss, either of their odour or lively colour; which would both be greatly injured or destroyed by a more slow exsiccation in the air. Some plants indeed, particularly those of the acrid kind, as horse-radish, scurvy-grass, and arum, lose their virtues by this process.

EXTE'NSOR, (from *extendo*, to stretch out), a name given to certain muscles whose office it is to extend the part to which they are fixed. The term is used in opposition to *flexor*.

EXTE'NSOR BREVIS DIGITORUM PEDIS, the *extensor brevis* of Douglas; a muscle of the toes situated on the foot. It arises fleshy and tendinous from the fore and upper part of the os calcis, and soon forms a fleshy belly, divisible into four portions, which send off an equal number of tendons that pass over the upper part of the foot under the tendons of the extensor longus digitorum pedis, to be inserted into its tendinous expansion. Its office is to extend the toes.

EXTE'NSOR CARPI RADIALIS BREVIOR, the *radialis externus brevior* of Albinus, and *radialis secundus* of Winslow; a muscle of the wrist, situated on the fore-arm. It arises tendinous from the external condyle of the humerus, and from the ligament that connects the radius to it, and runs along the outside of the radius. It is inserted by a long tendon into the upper and back part of the metacarpal bone of the middle finger. It assists in extending and bringing the hand backward.

EXTE'NSOR CARPI RADIALIS LONGIOR, the *radialis externus longior* of Albinus, and *radialis externus primus* of Winslow; a muscle of the carpus, situated on the fore-arm, that acts in conjunction with the former. It arises thin, broad, and fleshy, from the lower part of the external ridge of the os humeri, above its external condyle, and is inserted by a round tendon into the posterior and upper part of the metacarpal bone that sustains the forefingers.

EXTE'NSOR CARPI ULNA'RIS, the *ulnaris externus* of Albinus and Winslow; arises from the

outer condyle of the os humeri, and then receives an origin from the edge of the ulna: its tendon passes in a groove behind the styloid process of the ulna; to be inserted into the inside of the basis of the metacarpal bone of the little finger.

EXTE'NSOR DIGITORUM COMMUNIS. This muscle is situated on the fore-arm, and extends all the joints of the little fingers. It arises from the external protuberance of the humerus; and at the wrist, it divides into three flat tendons, which pass under the annular ligament, to be inserted into all the bones of the fore, middle, and ring fingers.

EXTE'NSOR DIGITORUM LONGUS. See EXTENSOR LONGUS DIGITORUM PEDIS.

EXTE'NSOR INDICIS. See INDICATOR.

EXTE'NSOR LONGUS DIGITORUM PEDIS, the *extensor longus* of Douglas; a muscle situated on the leg, that extends all the joints of the four small toes. It arises from the upper part of the tibia and fibula, and the interosseous ligament: its tendon passes under the annular ligament, and then divides into five, four of which are inserted into the second and third phalanges of the toes, and the fifth goes to the basis of the metatarsal bone. This last Winslow reckons a distinct muscle, and calls it *peronæus brevis*.

EXTE'NSOR LONGUS POLLICIS PEDIS. See EXTENSOR PROPRIUS POLLICIS PEDIS.

EXTE'NSOR MAGNUS. See GASTROCNEMIUS INTERNUS.

EXTE'NSOR MAJOR POLLICIS MANUS. See EXTENSOR SECUNDI INTERNODII.

EXTE'NSOR MINOR POLLICIS MANUS. See EXTENSOR PRIMI INTERNODII.

EXTE'NSOR OSSIS METACARPI POLLICIS MANUS, the *abductor longus pollicis manus* of Albinus, and *extensor primi internodii* of Douglas. It arises fleshy from the middle and posterior part of the ulna, from the posterior part of the middle of the radius, and from the interosseous ligament, and is inserted into the os trapezium, and upper part of the metacarpal bone of the thumb.

EXTE'NSOR POLLICIS PRIMUS. See EXTENSOR PRIMI INTERNODII.

EXTE'NSOR POLLICIS SECUNDUS. See EXTENSOR SECUNDI INTERNODII.

EXTE'NSOR PRIMI INTERNODII, the *extensor minor pollicis manus* of Albinus. This and the *extensor ossis metacarpi pollicis manus*, are named *extensor pollicis primus* by Winslow, and *extensor secundi internodii* by Douglas. It is a muscle of the thumb, situated on the hand, that extends the first bone of the thumb obliquely outwards. It arises fleshy from the posterior part of the ulna, and from the interosseous ligament, and is inserted tendinous into the posterior part of the first bone of the thumb.

EXTE'NSOR PROPRIUS POLLICIS PEDIS, the *extensor longus pollicis pedis* of Douglas; an extensor muscle of the great toe, situated on the foot. It arises by an acute, tendinous, and fleshy beginning, some way below the head and anterior part of the fibula, along which it runs to near its lower extremity, connected to it by a number of fleshy fibres, which descend obliquely, and form a tendon which is inserted into the posterior part of the first and last joint of the great toe.

EXTE'NSOR SECUNDI INTERNODII, the *extensor major pollicis manus* of Albinus, *extensor pollicis secundus* of Winslow, and *extensor tertii internodii* of Douglas. It is a muscle of the thumb, situated on the hand, that extends the last joint of the thumb obliquely backwards. It arises tendinous and fleshy from the middle part of the ulna, and the interosseous ligaments; it then forms a tendon, which runs through a small groove at the inner and back part of the radius, to be inserted into the last bone of the thumb.

EXTE'NSOR SECUNDI INTERNODII INDICIS PROPRIUS. See INDICATOR.

EXTE'NSOR TARSI MINOR. See PLANTARIS.

EXTE'NSOR TARSI SURALIS. See GASTROCNEMIUS INTERNUS.

EXTE'NSOR TERTII INTERNODII MINIMI DIGITI. See ABDUCTOR MINIMI DIGITI MANUS.

EXTE'NSOR TERTII INTERNODII INDICIS. See PRIOR INDICIS.

EXTENUATION, a loss of plumpness, or general decay in the muscular flesh of the whole body.

EXTE'RNUS MA'LLEI. See LAXATOR TYMPANI.

EXTRACT, in pharmacy, a term long used, in the common and true acceptation, to express a thing extracted. Hence, it was applied to substances of all kinds which were extracted from heterogeneous bodies, by the action of any menstruum, and again reduced to a consistent form, by the evaporation of that menstruum. Lately, however, Extract has been used in a different and much more limited sense, as the name for a peculiar principle, which is often indeed contained in extracts, and which before had no proper appellation. It is in the former sense that we employ it here, and in which we wish it to be only used, while a new word should be invented as the name of the new substance. Dr. And. Duncan proposes to call it *extractive*.

The liquors which dissolve certain substances in their pure state, serve likewise to *extract* them from admixtures of other matter. Thus rectified spirit of wine, the menstruum of essential oils and resins, takes up the virtues of the resinous and oily vegetables; as water does those of the mucilaginous and saline; the inactive earthy parts remaining untouched by both. Water extracts likewise

from many plants, substances, upon which, by themselves, it has little effect; even essential oils being, as we have formerly observed, rendered soluble in that fluid, by the admixture of gummy and saline matter, of which all vegetables participate in a greater or less degree. Thus many of the aromatic plants, and most of the bitters and astringents, yield their virtues to this menstruum.

Extraction is performed by *macerating* or *steeping* the subject in its appropriate menstruum, in the cold; or *digesting* or *circulating* them, in a moderate warmth; or *infusing* the plant in the boiling liquor, and suffering them to stand in a covered vessel till grown cold; or actually *boiling* them together for some time: but if the vegetable matter is itself succulent and watery, it is sometimes only necessary to express the juice, and evaporate it to the proper consistence.

Heat greatly expedites extraction; but by these means proves as injurious to some substances, by occasioning the menstruum to take up their grosser and more ungrateful parts, as it is necessary for enabling it to extract the virtues of others. Thus guaiacum or logwood impart little to aqueous liquors, without a boiling heat, whilst even a small degree of warmth proves greatly prejudicial to the fine bitter of carduus benedictus. This plant, which, infused in boiling, or digested in sensibly hot water, gives a nauseous taste, so offensive to the stomach as to promote vomiting, yields to the cold element a grateful bitter.

As heat promotes the dissolving powers of liquids, so cold, on the other hand, diminishes it. Hence tinctures, or extractions made by a considerable heat, deposit in cold weather a part of their contents, and thus become proportionably weaker; *a circumstance which deserves particular regard.*

There are various extracts exhibited in our pharmacopœias: their properties may be known by turning to the name of the principal subject.

EXTRACTION, in surgery, the drawing from, or out of the body, any thing that is offensive, as a decayed tooth, &c.

EXTRANEOUS, any foreign substance, as a thorn in the flesh. It is also used to express the same as external, and frequently signifies the same as excrescence, or something that is not natural to the substance it grows out of.

EXTRAVASATION, (from *extra*, without, and *vas*, a vessel); the escape of fluids from the vessels naturally containing them. See Ecchymoma.

EXULCERATION, (from *exulcero*, to cause ulcers); the same as ulcer, though occasionally applied to that species which is small and superficial. It is popularly termed a *fester.*

EXU'VIÆ, (from *exuo*, to strip off), the cuticle of the serpent, which is cast every spring, affords an instance.

EYE, (*oculus*, of οκκος, Gr. from οπτομαι, *to see)*; the organ of vision, situated in a socket called the *orbit*, at the side of the root of the nose.

The globe of the eye is composed of three transparent humours, which, from their supposed resemblances, bear the several denominations of the *aqueous*, the *crystalline*, and the *vitreous.* These humours are contained in three proper coats, tunics, or, as they have been more recently called, *membranes*, the *sclerotica*, the *choroides*, and the *retina;* but besides these, there is another, common to the globe and eye-lids, called the *conjunctiva* (see those articles). Of the proper coats, the tunica sclerotica is the outermost. This, in the posterior and far greater part of its circumference, is white and opaque; but, in the anterior, is transparent, and takes the name of *cornea* (see Cornea).

The tunica choroides is situated on the inside of the sclerotica, between it and the retina. It is strongly attached to the sclerotica, round the margin, where the cornea begins; whence it passes on, and becomes visible through the transparency of that coat. This part of the choroides is called *iris*, being of various colours in different persons; and in its centre is a round perforation, called the *pupil*, for the purpose of admitting the rays of light. The sclerotica and choroides are well supplied with blood-vessels, particularly the last; the ramifications of which, when well injected, appear to be wonderfully interwoven with one another.

The *retina*, or internal coat, appears to be an expansion of the medullary part of the optic nerve, being a white, thin membrane, of a very soft and tender texture. It lies immediately behind the vitreous humour, round which it is continued to the borders of the crystalline, and is generally believed to be the immediate seat of the sense of vision (see Retina).

The globe of the eye rests in the orbit, upon a large body of adipose membrane; and is moved in different directions, by four straight, and two oblique muscles. Five of these take their origin from the bottom of the orbit; the inferior oblique alone rising from its edge: and they are all continued forward, till they are inserted, by a tendinous expansion, from its white colour, called *tunica albuginea*, into the anterior part of the sclerotica.

The *tunica conjunctiva* is a thin transparent membrane, which lines the inner surface of the eye-lids, and, at the edge of the orbit, has a fold, and is continued forward over the anterior half of the globe of the eye. It is exterior to all the other coats of the eye, and connected with the tunica albuginea, by means of a cellular substance; from which it may easily be separated, in the dead subject, by dissection. Though, in a sound state, it contains only the serous part of the blood, it is, notwithstanding, extremely vascular; as is proved by injections, and also by the inflammations to

[*A single page which completes Vol. I. will be given at the end of the work.*]

which it is liable. According to Winslow, it is perforated by innumerable and almost imperceptible pores.

The vascular state of this coat appears to be much greater, in that part which lines the inside of the eye-lids, than in that which covers the eye; and its continuance, from the eye-lids to the eyes, is of great use, to prevent the ill consequences which might otherwise ensue, from the insinuation of extraneous bodies between them.

The tears are secreted by a conglomerate gland, called *glandula lachrymalis*, which is situated in a small depression of the orbital process of the os frontis, near the outer angle of the orbit; from which they are poured out by small ducts, and continually spread over the surface of the eye, to keep it clear and transparent. They pass from the eye, through two minute orifices, at the inner angle, called the *puncta lachrymalia*, which open into a small bag, called *sacculus lachrymalis*; and this bag is continued thence, through a bony channel, and opens immediately into the nose.

The little red body, observable at the great or inner angle of the eye, is called *caruncula lachrymalis*. Mr. Ware, who describes the structure of this important organ, says, it once was thought to be the secretory organ of the tears, until a more accurate dissection discovered the true gland at the opposite angle. Some have since supposed, that it secretes an oily humour, like that issuing from the small glands on the inside of the eye-lids: but, in fact, we seem to have acquired no certain knowledge either as to its structure or use. It may be said to direct the tears into the puncta lachrymalia; and, in that office, is much assisted by a reduplication of the tunica conjunctiva, which has been called valvula semilunaris. This valve is to be seen plainest, when the eye is turned towards the nose. It is situated close to the caruncle; and is shaped like a crescent, with its points inclined to the puncta lachrymalia.

The situation and figure of the eye-lids are too obvious, to need description. They hang like veils or curtains before the eyes; and are furnished with muscles, capable of very quick motion, to defend the eyes from those injuries, to which their situation might expose them. The structure of the eye-lids is of the reticular kind; and they are very easily distended by accident or disease. The edge of each of the lids is principally formed by the extremity of the thin cartilage, called *tarsus*. These edges take the denomination of *ciliary*, and are so adapted to each other, as that, when the two lids are extended over the eye, they meet. It deserves notice, that the ciliary edges are not sharp, like the edge of a knife; but rather flat, like the back of it; having properly two terminations, one external, and the other internal: the former of these it is, that meet when the lids are extended; while the latter, or internal, still preserve a small distance from each other; leaving a gutter or groove, through which the tears are supposed to pass from the lachrymal gland to the puncta lachrymalia, while we are asleep. It should also be remembered, that the cilia, or eye-lashes, arise out of the external termination of these cartilages; and, on the internal, at an evident distance from them, is a line of small orifices, which is the excretory ducts of small glands, that lie on the inner surface of the tarsus, and are called *glandulæ ciliares*, vel *Meibomii*. The use of these glands is to secrete a sebaceous matter, similar to soft wax; which constantly covers the edges of the lids, and keeps them supple.

The foregoing account of the eye, and its appendages, seems to contain all that is necessary to a general understanding of the structure of that organ; but the several parts appear in detail under their proper heads, as do also the diseases affecting them. See OPHTHALMIA, EPIPHORA, GUTTA SERENA, &c. The functions of the eye are explained under the article VISION, SIGHT, &c.

EYE-BRIGHT. See EUPHRASIA.

EYE-BROW, *supercilium;* a layer of short hair which lies thick upon the lower part of the frontal bone, on the superior prominent part of the orbit. See EYE.

EYE-LID, *palpebra;* the semilunar moveable production of the skin, which covers the eye when shut. It is distinguished into upper and under eye-lid. See EYE.

END OF THE FIRST VOLUME.

Fig. 2.

Fig. 3.

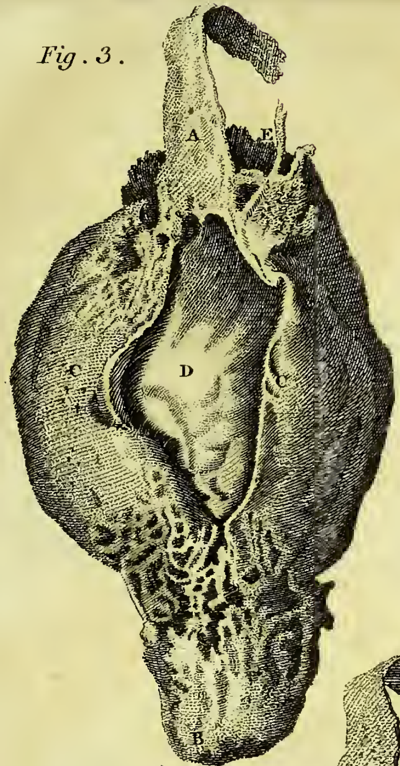


Fig. 1.

Fig. 4.

Fig. 5.

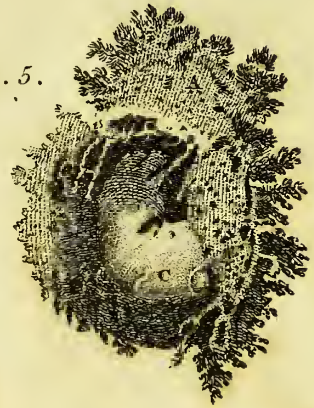
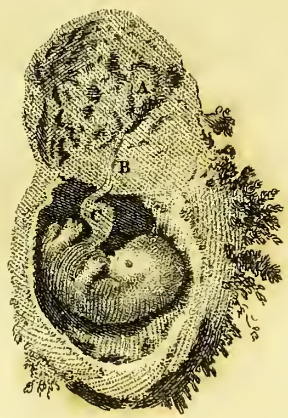
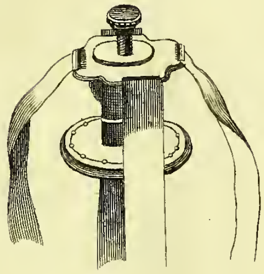


Fig. 6.



Campbell Sc.

Artery Bandage.



Acoustic Tube.

Fig. 3.

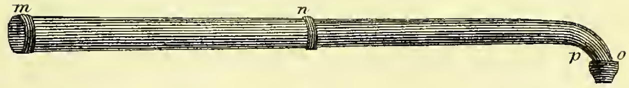


Fig. 1.

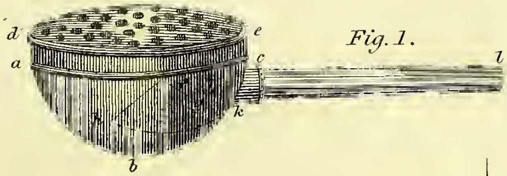
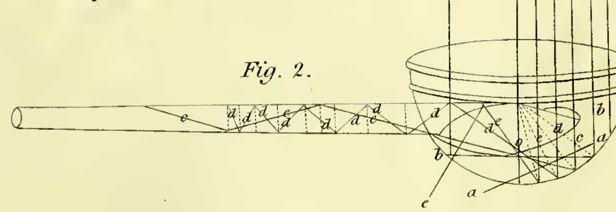
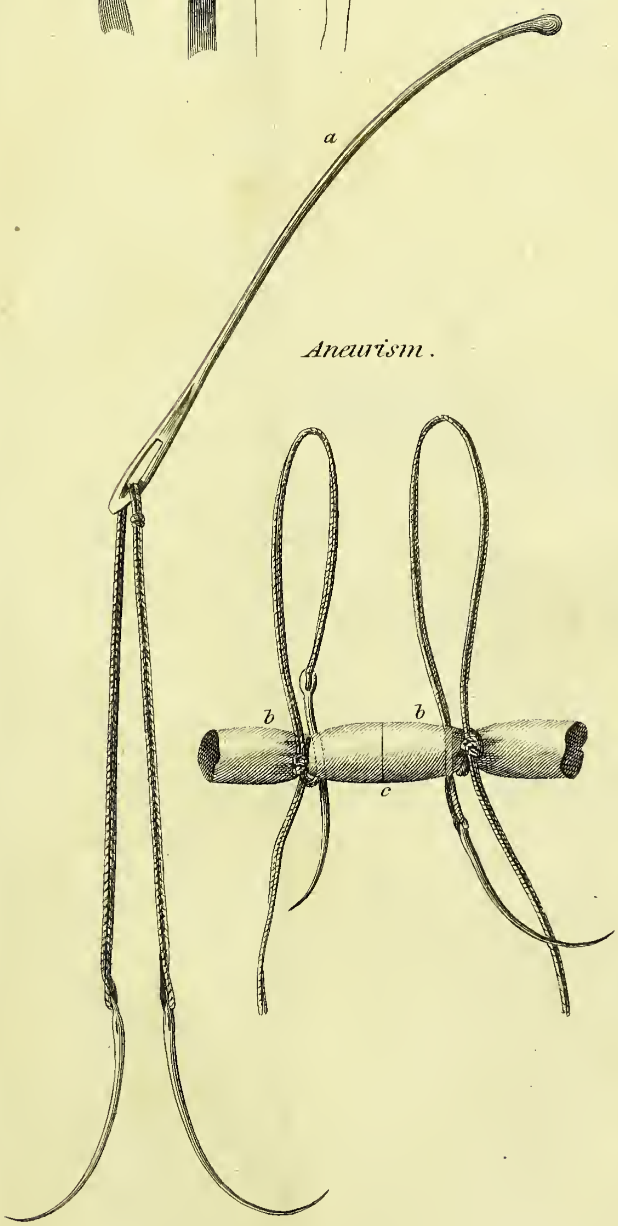


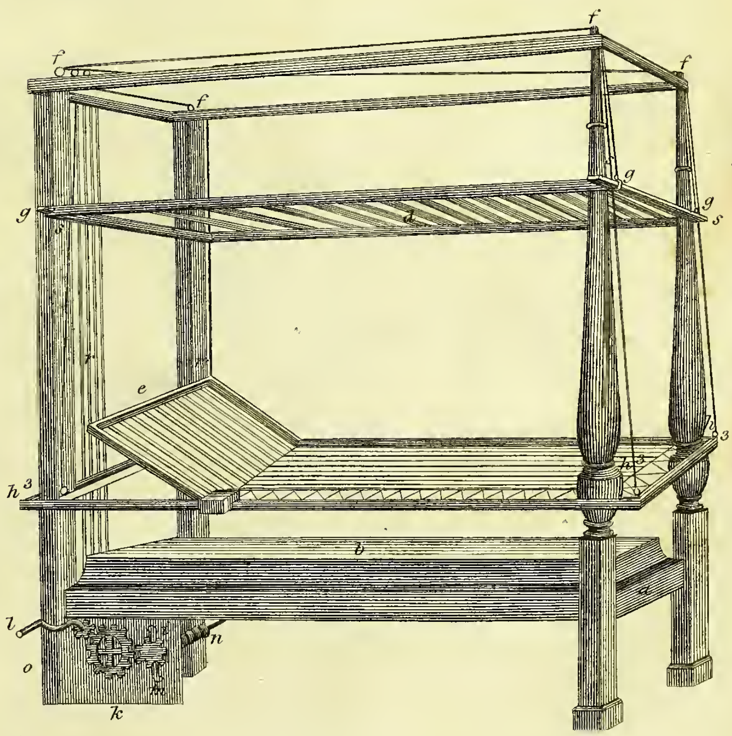
Fig. 2.



Aneurism.

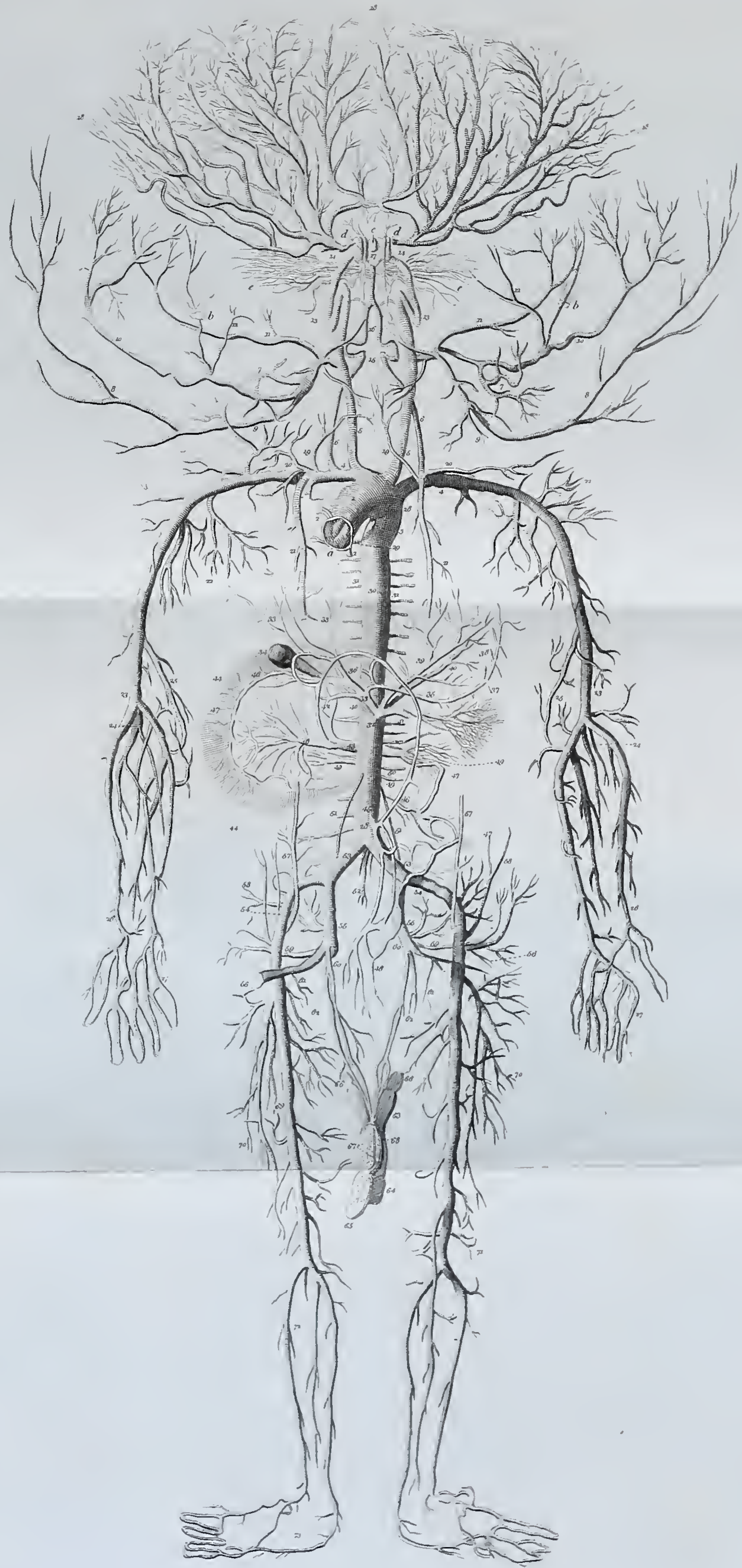


Bedstead for the Wounded.



Campbell. sculp.

Arteries. Pl. IV.



Mitchell sculp.

Fig. 1.

Fig. 2.

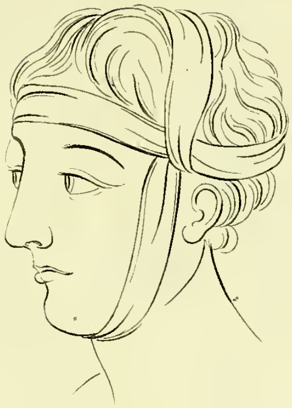


Fig. 3.

Fig. 4.

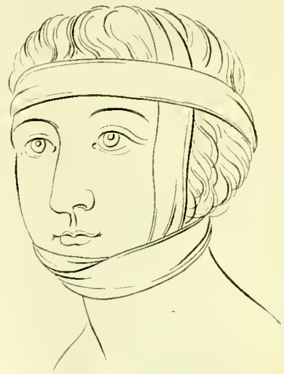


Fig. 5.

Fig. 6.

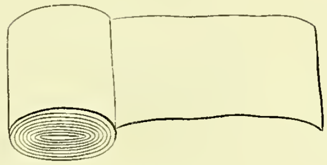


Fig. 7.

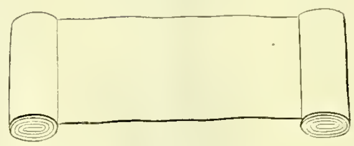


Fig. 8.

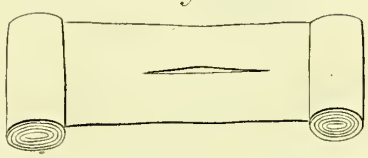


Fig. 9.

Fig. 10.

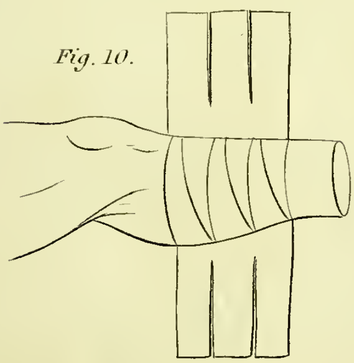


Fig. 11.

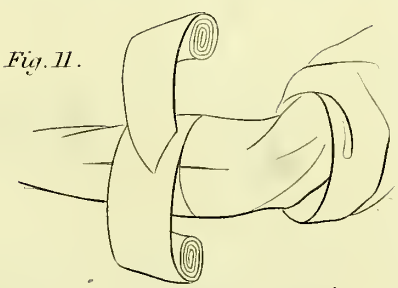


Fig. 12.

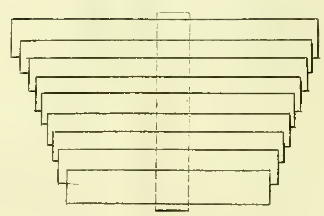


Fig. 14.

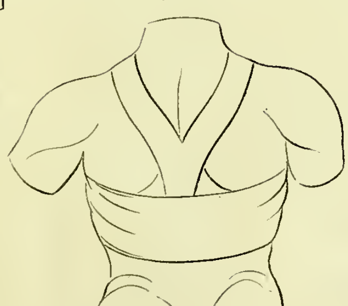


Fig. 13.

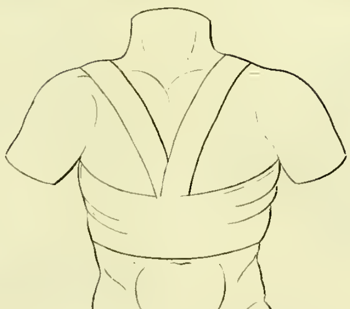


Fig. 15.

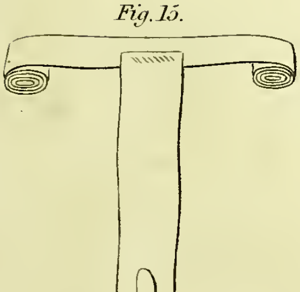
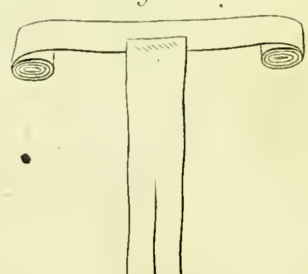
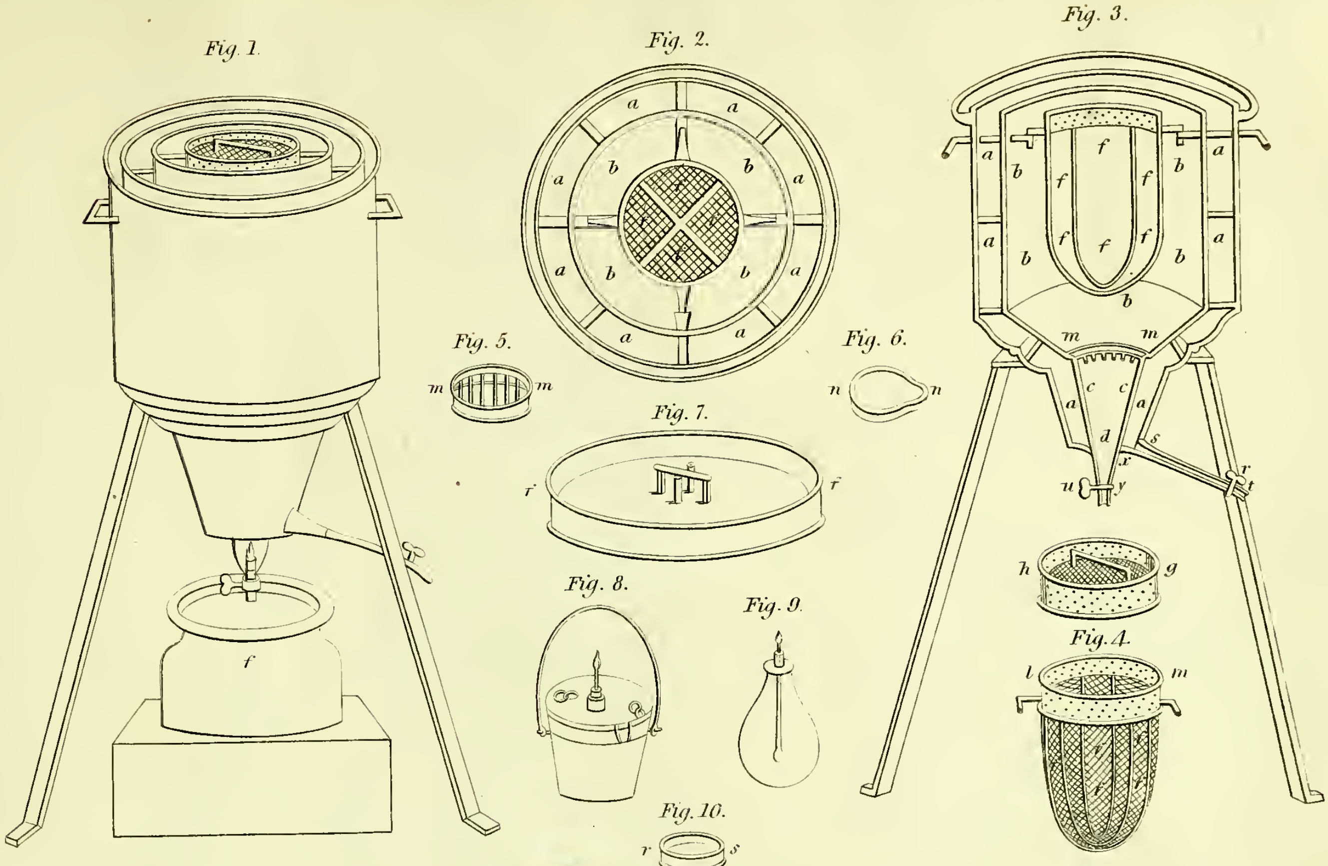


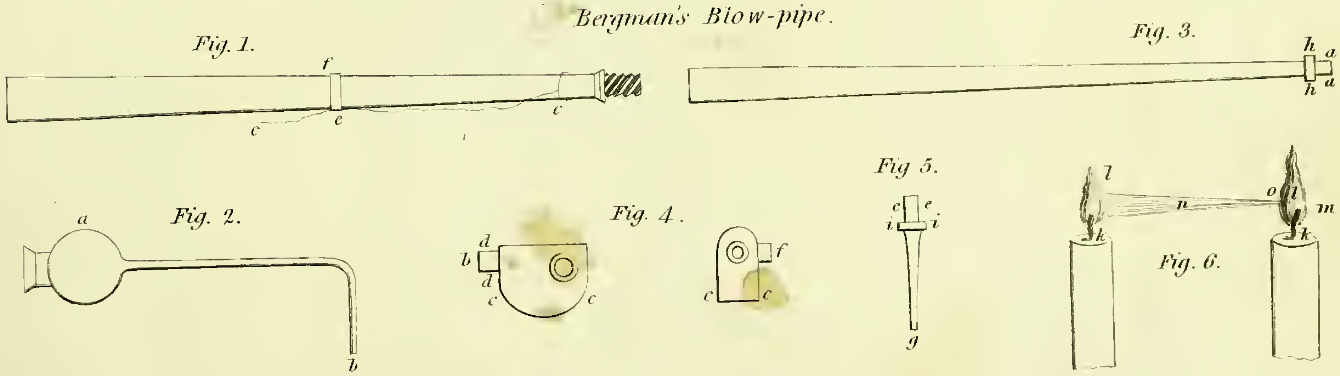
Fig. 16.



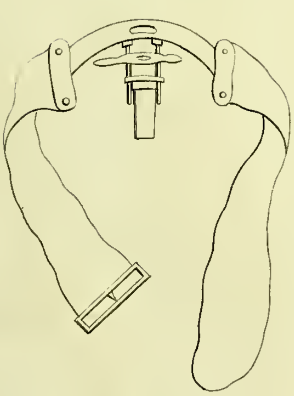
Calorimeter.



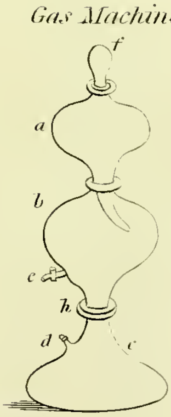
Bergman's Blow-pipe.



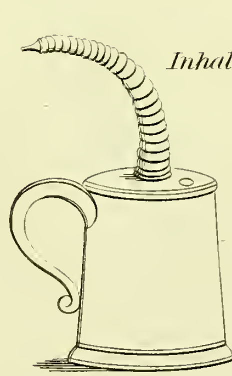
Bronchotomy.



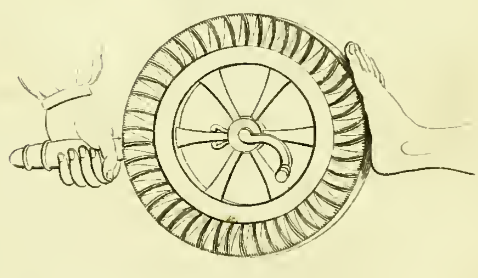
Gas Machine.



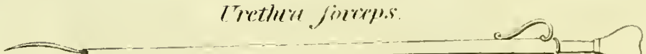
Inhaler.



Metallic Brush.

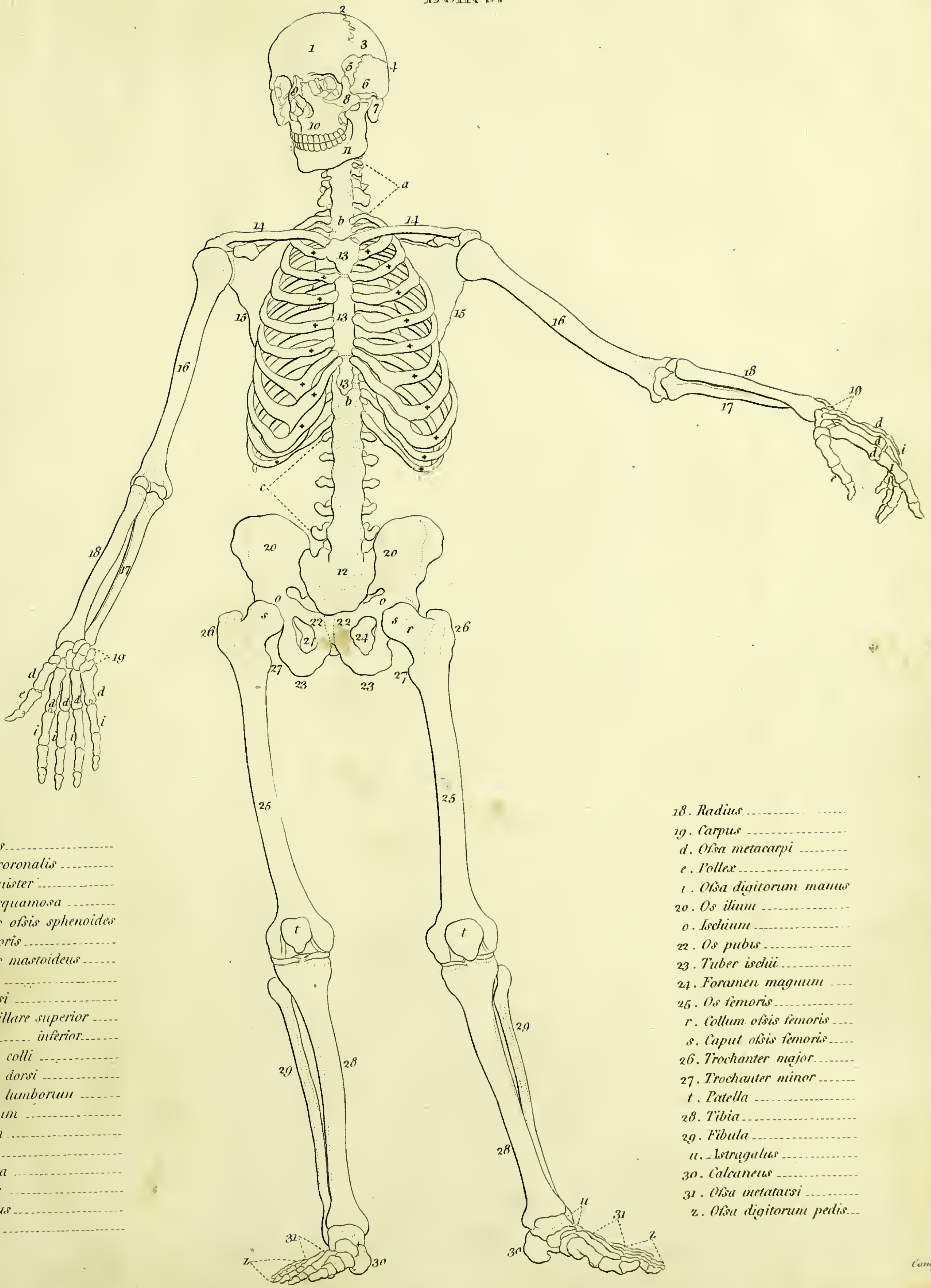


Urethra forceps.



Campbell sculp.

Bones.

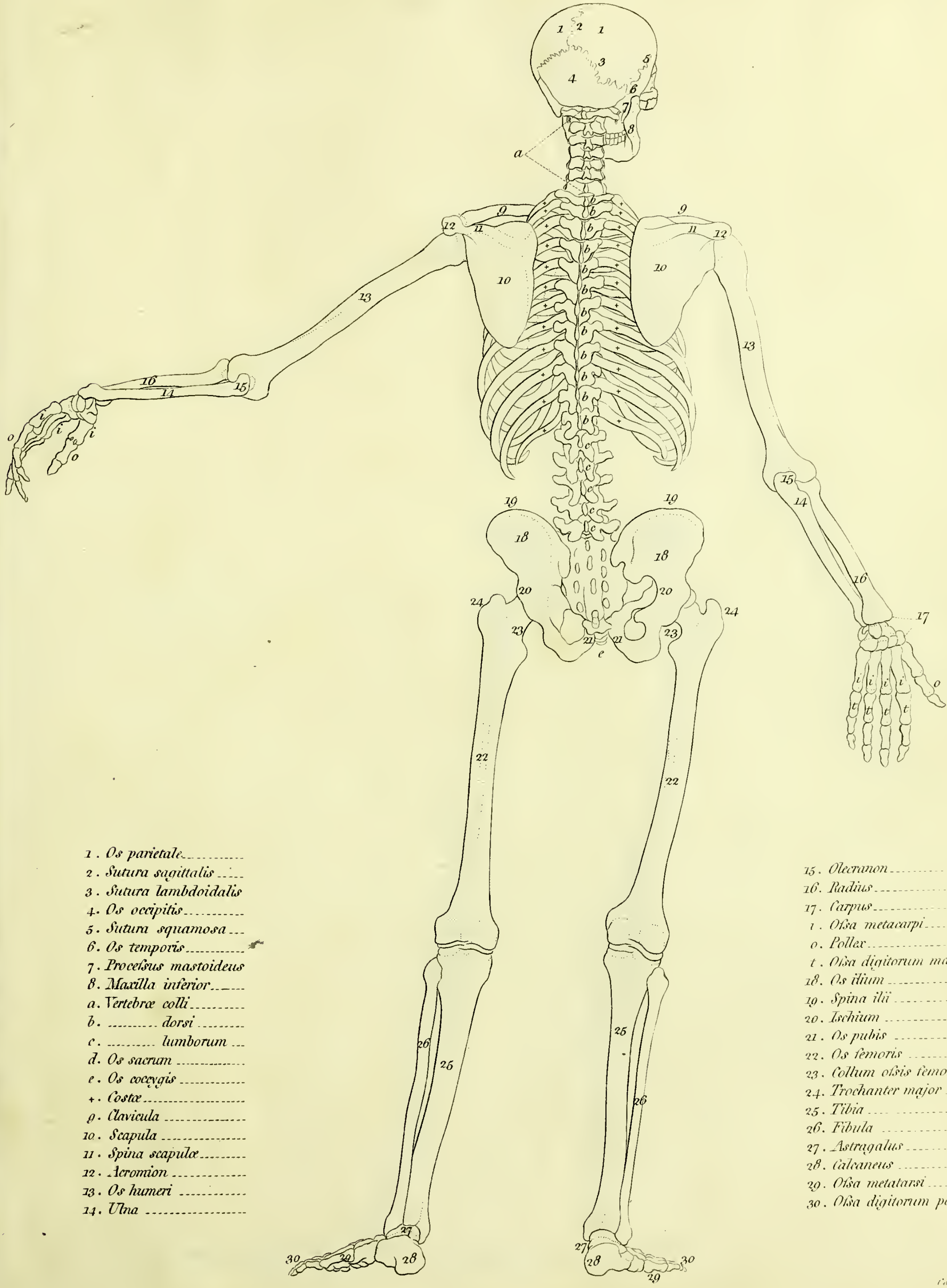


. *Os frontis*
. *Sutura coronalis*
. *Vertex sinister*
. *Sutura squamosa*
. *Proceſsus oſsis sphenoides*
. *Os temporis*
. *Proceſsus mastoideus*
. *Os mali*
. *Oſsa nasi*
o. *Os maxillare superior*
1. .... *inferior*
a. *Vertebræ colli*
b. .... *dorsi*
c. .... *lumborum*
2. *Os sacrum*
3. *Sternum*
+. *Costæ*
4. *Clavicula*
5. *Scapula*
6. *Humerus*
7. *Ulna*

18. *Radius*
19. *Carpus*
d. *Oſsa metacarpi*
e. *Pollex*
i. *Oſsa digitorum manus*
20. *Os ilium*
o. *Ischium*
22. *Os pubis*
23. *Tuber ischii*
24. *Foramen magnum*
25. *Os femoris*
r. *Collum oſsis femoris*
s. *Caput oſsis femoris*
26. *Trochanter major*
27. *Trochanter minor*
t. *Patella*
28. *Tibia*
29. *Fibula*
u. *Astragalus*
30. *Calcaneus*
31. *Oſsa metatarsi*
z. *Oſsa digitorum pedis*

Campbell

Campbell sculp.



1. *Os parietale*
2. *Sutura sagittalis*
3. *Sutura lambdoidalis*
4. *Os occipitis*
5. *Sutura squamosa*
6. *Os temporis*
7. *Processus mastoideus*
8. *Maxilla inferior*

a. *Vertebræ colli*
b. .... *dorsi*
c. .... *lumborum*
d. *Os sacrum*
e. *Os coccygis*
+. *Costæ*

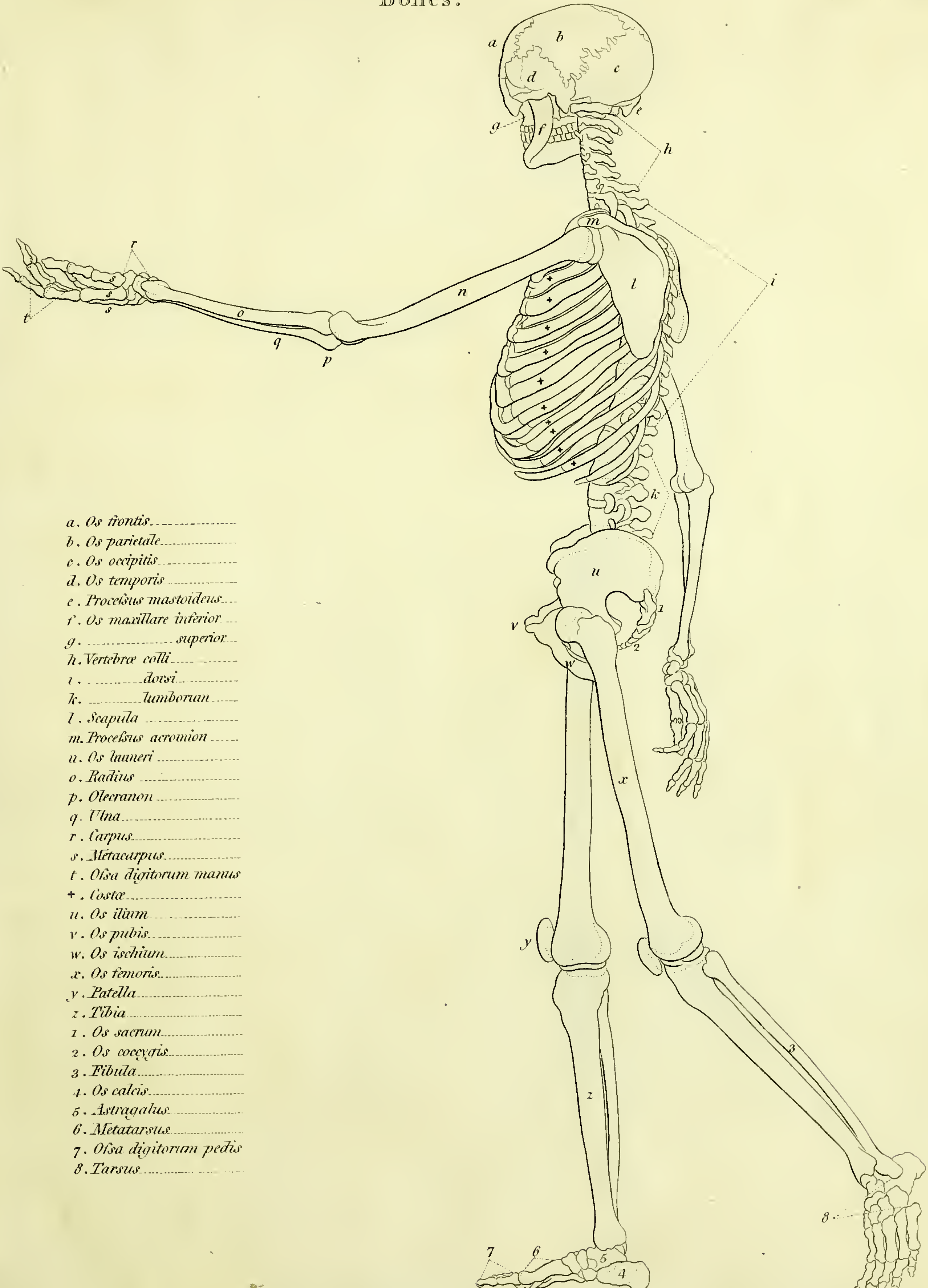
9. *Clavicula*
10. *Scapula*
11. *Spina scapulæ*
12. *Acromion*
13. *Os humeri*
14. *Ulna*
15. *Olecranon*
16. *Radius*
17. *Carpus*

i. *Ossa metacarpi*
o. *Pollex*
t. *Ossa digitorum manus*

18. *Os ilium*
19. *Spina ilii*
20. *Ischium*
21. *Os pubis*
22. *Os femoris*
23. *Collum ossis femoris*
24. *Trochanter major*
25. *Tibia*
26. *Fibula*
27. *Astragalus*
28. *Calcaneus*
29. *Ossa metatarsi*
30. *Ossa digitorum pedis*

Campbell. Sculp.

Campbell sculp.t



a. *Os frontis*
b. *Os parietale*
c. *Os occipitis*
d. *Os temporis*
e. *Processus mastoideus*
f. *Os maxillare inferior*
g. ——— *superior*
h. *Vertebræ colli*
i. ——— *dorsi*
k. ——— *lumborum*
l. *Scapula*
m. *Processus acromion*
n. *Os humeri*
o. *Radius*
p. *Olecranon*
q. *Ulna*
r. *Carpus*
s. *Metacarpus*
t. *Ossa digitorum manus*
+. *Costæ*
u. *Os ilium*
v. *Os pubis*
w. *Os ischium*
x. *Os femoris*
y. *Patella*
z. *Tibia*
1. *Os sacrum*
2. *Os coccygis*
3. *Fibula*
4. *Os calcis*
5. *Astragalus*
6. *Metatarsus*
7. *Ossa digitorum pedis*
8. *Tarsus*

Campbell sculp.

Bones.

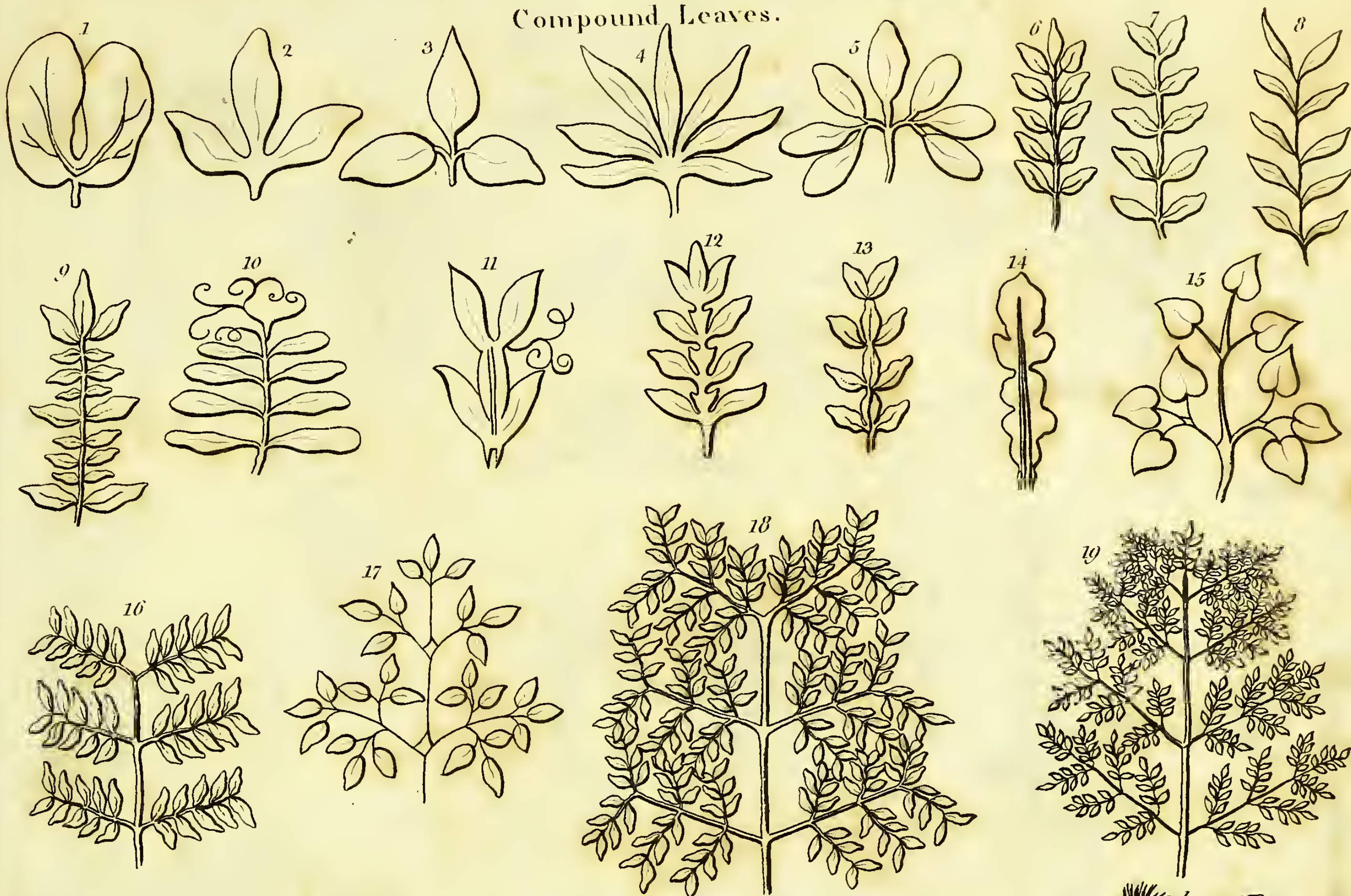
...mpbell sculp.


Clafses and Orders
Parts of the flower
Parts of the fruit


Roots.
Trunks.
Fulcra.

Simple Leaves.

Compound Leaves.



Determinate Leaves.

Foliation.

Botany.


Miscellaneous.
Rheum Palmatum or True Rhubarb.
Bignonia Radicans
or Trumpet Flower.

Calculi.

Fig. 1.

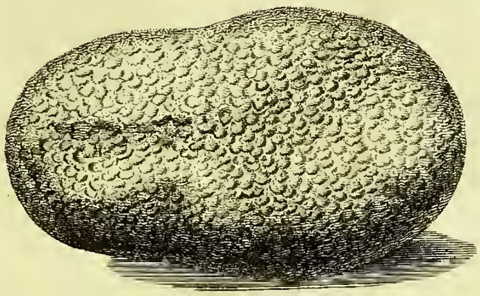


Fig. 2.

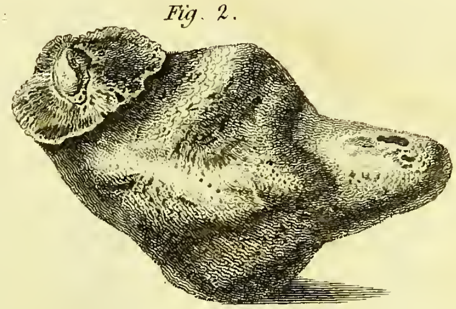


Fig. 3.

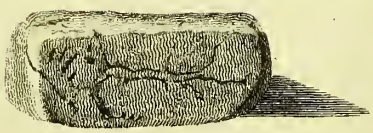


Fig. 5.

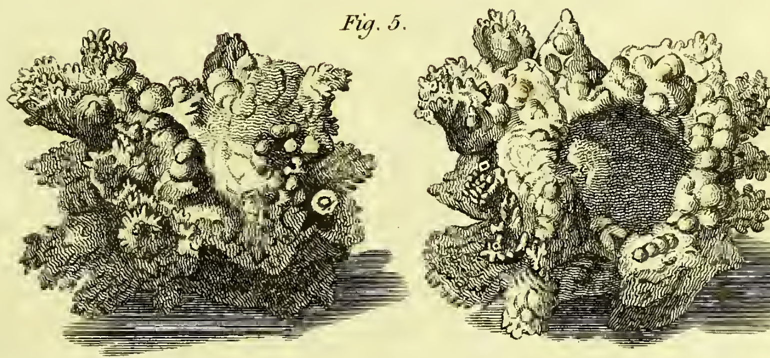


Fig. 4.

Fig. 6.

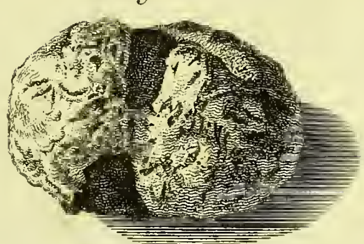


Fig. 7.

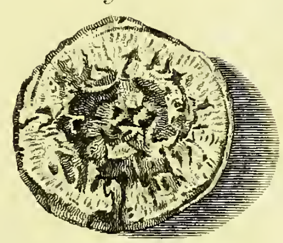


Fig. 8.

Fig. 9.

Campbell. sculp.^t

Cataract.

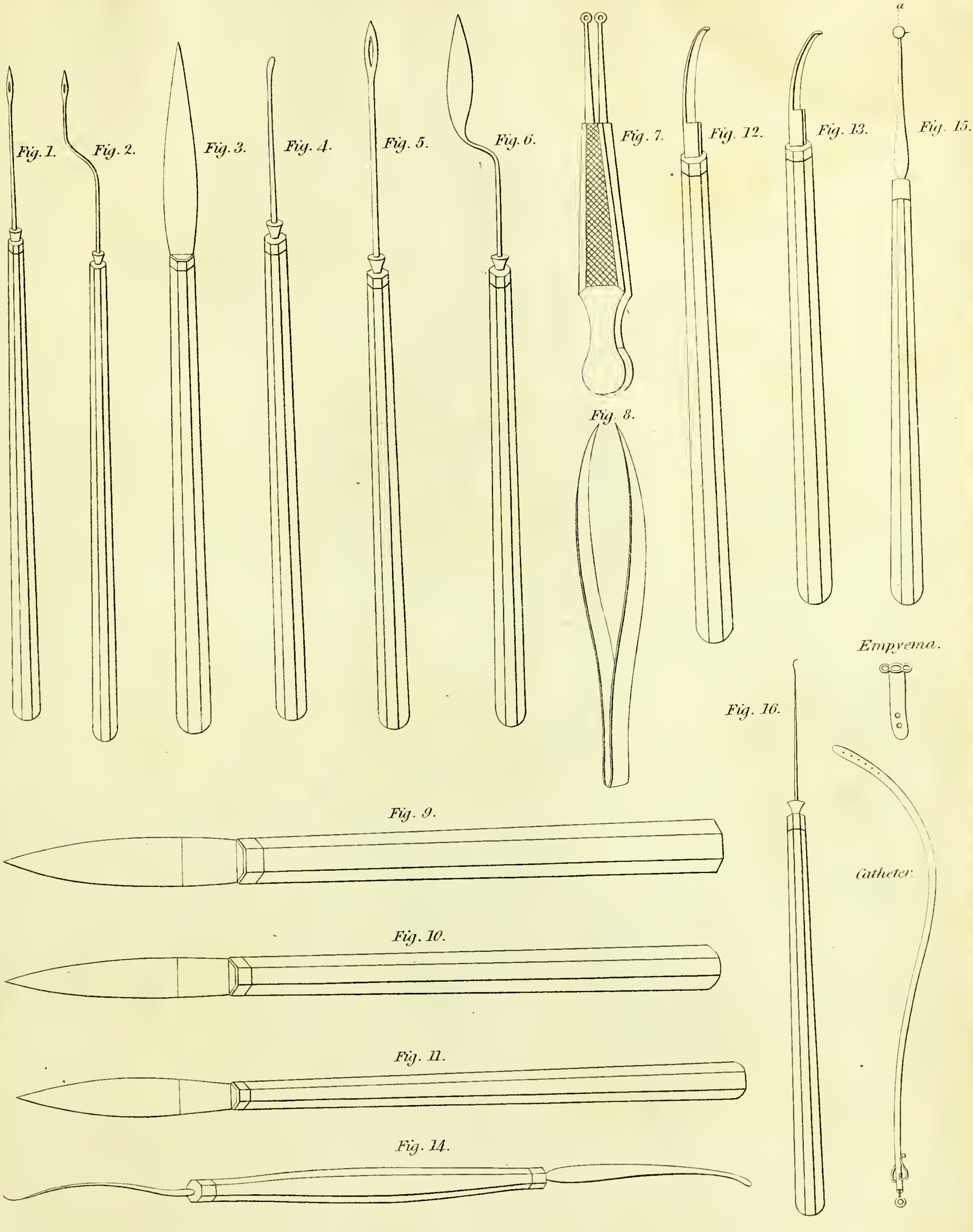
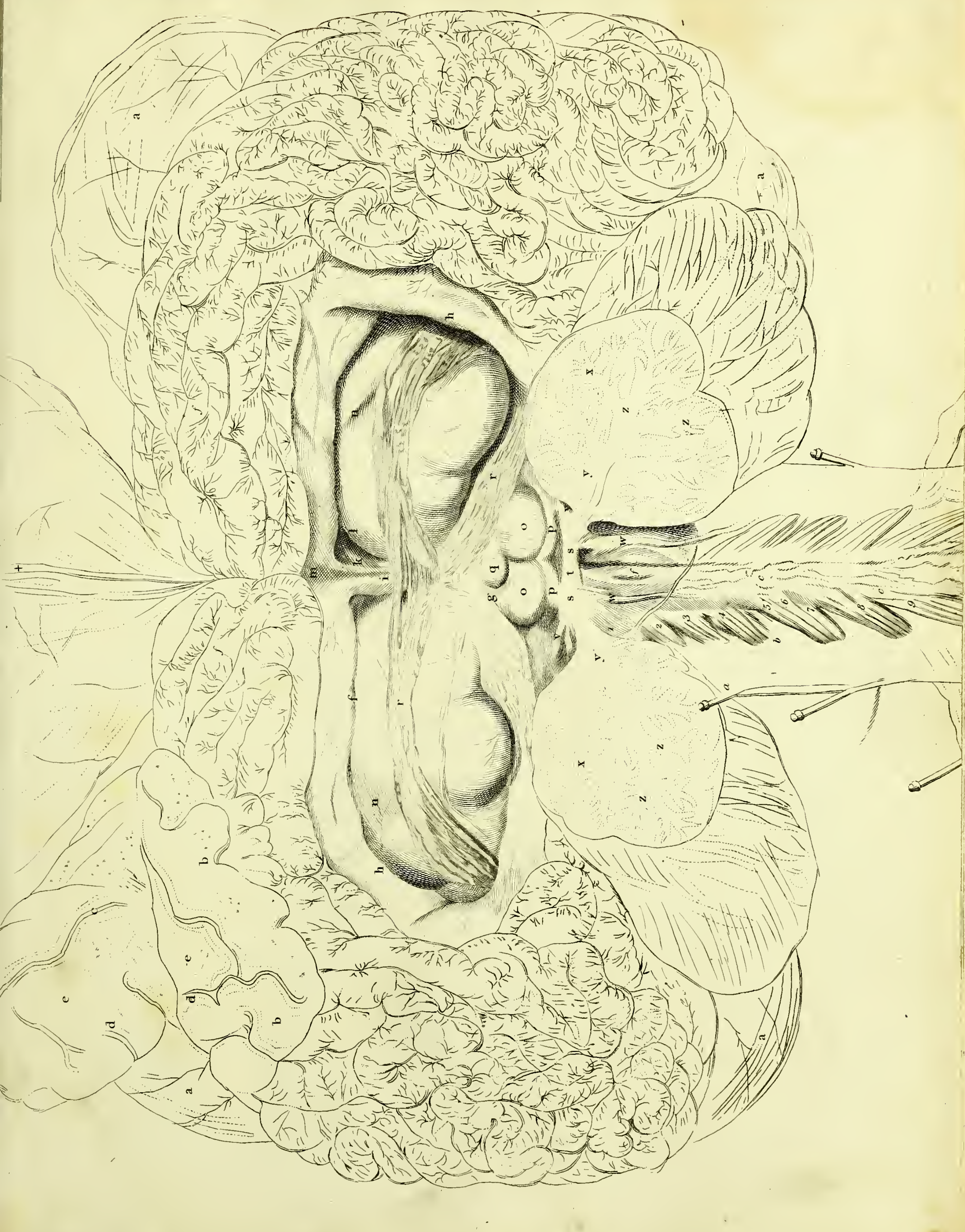
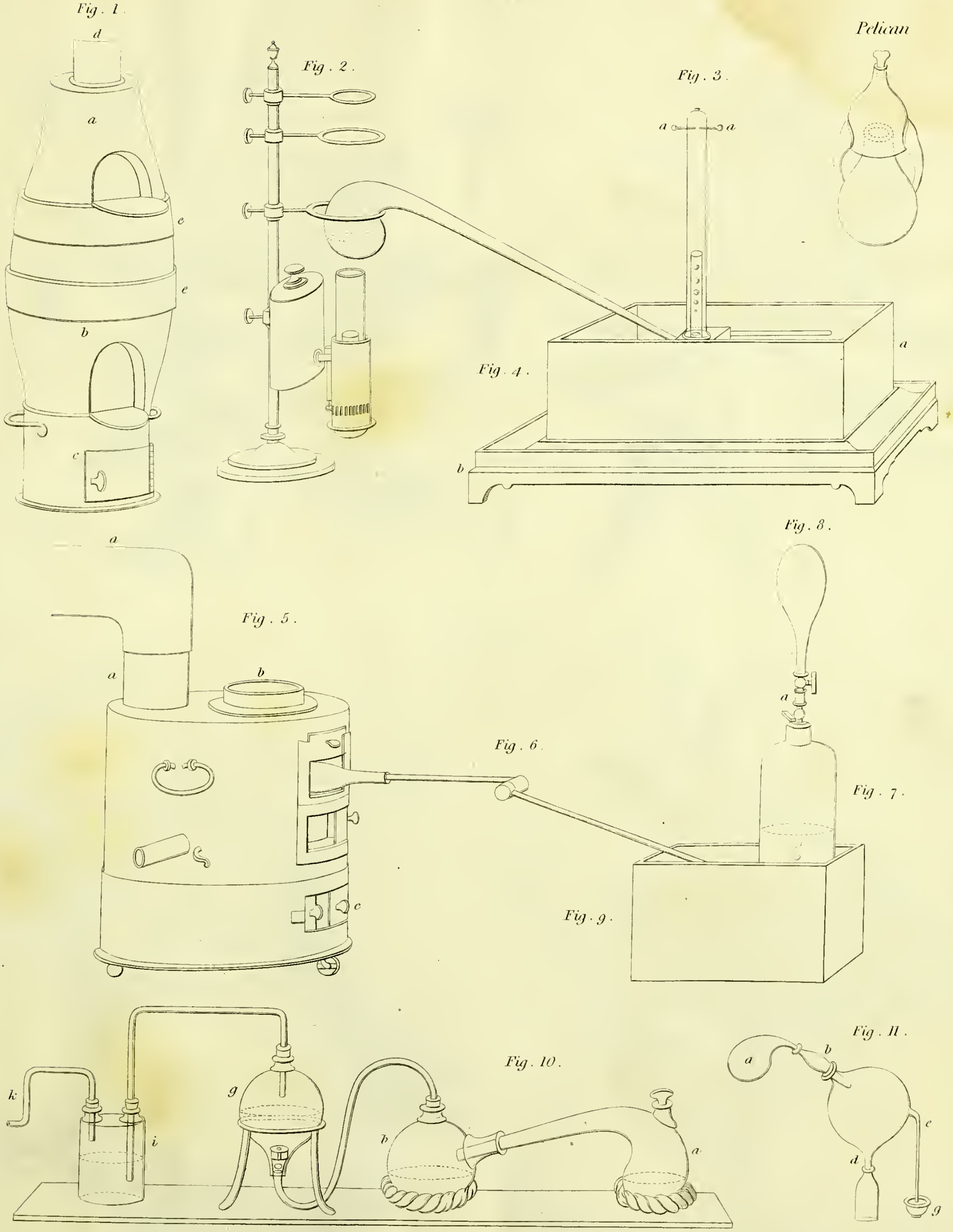


Fig. 1.
Fig. 2.
Fig. 3.
Fig. 4.
Fig. 5.
Fig. 6.
Fig. 7.
Fig. 12.
Fig. 13.
a
Fig. 15.
Fig. 8.
Empyema.
Fig. 16.
Fig. 9.
Catheter.
Fig. 10.
Fig. 11.
Fig. 14.

Cerebrum.



Chemical Apparatus.

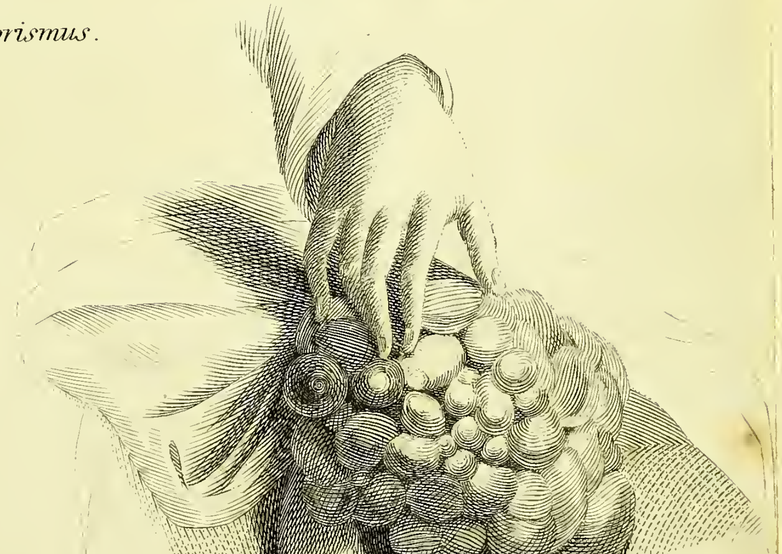


Cinchona.

Cinchona officinalis.

Cinchona Caribæa.

Clitorismus.



Campbell sculp.

[illegible]